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July/August 2021

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Cover: A faience pendant dating from between 1200 and 1150 B.C. found in the necropolis of Ugarit in Syria depicts a female mask.

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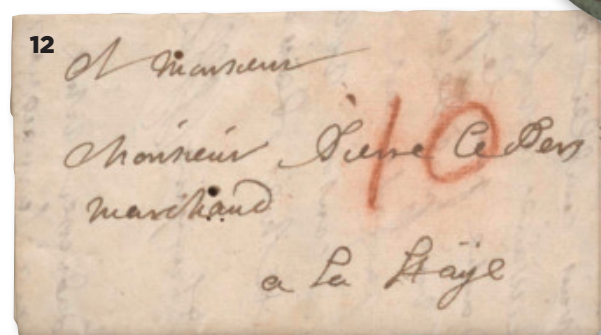
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BY DANIEL WEISS

ARCHAEOLOGY.ORG

■ **MORE FROM THE ISSUE** To see an animation of the unfolding of a sealed 17th-century letter, go to archaeology.org/unfolding. To see more images of Kiska Island's World War II remains, go to archaeology.org/kiska.

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THE PEOPLE WE MEET

Archaeologists seldom know the names of the people whose lives they study. But every so often, they have the chance to encounter people of the past and learn their names, even as they uncover information about their daily habits and their place in society. In this issue, you, too, will have that rare opportunity to meet the people behind the archaeological record.



In “The Ugarit Archives,” you’ll get to know Urtenu, a Bronze Age merchant who worked from home long before it once again became popular or necessary. In his modest suburban house in the ancient city of Ugarit on the Syrian coast, Urtenu maintained a library filled with more than 600 tablets that chronicle his financial dealings and efforts at diplomacy with Hittite kings and Egyptian pharaohs. These potentates’ names, along with that of Thariyelli, the powerful queen of Ugarit, are inscribed on tablets found in Urtenu’s house and throughout the city.

Thousands of miles from the shores of Syria, you will meet a dynasty of rulers who unified more than 160 islands in Polynesia into a single state. In “Rise of the Kings of Tonga,” you’ll learn the name of the first of these rulers, ‘Aho‘eitu, as well as that of the dynasty he founded, the Tu‘i Tonga. These names do not survive pressed into tablets, but rather in oral histories that have been passed down for generations, which archaeologists are now using to reconstruct the history of the Tongan state.

One of the other people of the past you will encounter is Ajpach’ Waal, an emissary of the king of the influential Maya city of Calakmul, whose life story is told in “Autobiography of a Maya Ambassador.” After completing a grueling 400-mile round-trip mission on the king’s behalf, Ajpach’ Waal returned to his home city of El Palmar. There, he dedicated a recently unearthed monument memorializing his diplomatic achievements, on which he inscribed his name.

And finally, there are the residents of an elegant home in the heart of Pompeii, whom you will meet in their vibrantly painted—and just restored—private garden tucked away from the bustling city. On the house’s facade is written the name Lucius Ceius Secundus, a Pompeian magistrate whose family archaeologists believe owned the house. In “Pompeii’s Urban Oasis,” you can join them as they escape the blazing summer sun.

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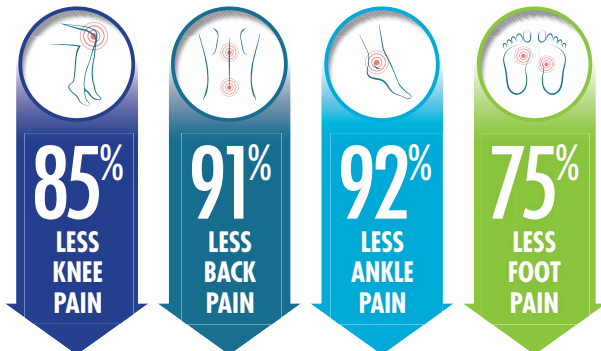
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FROM THE PRESIDENT

LOOKING FORWARD

As I reflect on this past year of the pandemic and the way it has disrupted our routines and daily connections, I also see how it has brought out examples of resilience and has created space for new opportunities.

At the AIA, we launched a series of new initiatives. One of these is Archaeology Abridged, short lectures including “Ötzi the Iceman’s Prehistoric Medical Kit”; “The Extraordinary Archaeological Finds from Roman Vindolanda,” which discusses the largest collection of ancient Roman shoes ever found; “A Toast to Ancient Greek Wine Drinking”; and most recently, “Discovering Sutton Hoo.” I’d like to thank the AIA’s staff; our speakers, Patrick Hunt, Elizabeth M. Greene, Kathleen Lynch, and Martin Carver, for their enthusiasm and the terrific sense of fun they brought to these topics; and the audience of thousands around the world who joined us for these talks. You can access them on our website—just look for Archaeology Abridged.

Peter Bogucki spoke to us in March about his award-winning book, *The Barbarians*, in the inaugural Holton Lecture to celebrate the AIA’s annual award for the best book about archaeology for the public. For those of you who wanted to know more about the people behind the archaeology, we’ve developed brief profiles that can be found on the website at Archaeologists You Should Know. Two examples among many are John Wesley Gilbert, the first African American to excavate in Greece, and Canadian Mary Ross Ellingson, one of archaeology’s newly rediscovered “hidden” women.



South Temple complex, Tarxien Temples, Malta, created by Reagan Bullock

new category, Pick Your Own Monument, which inspired several entries on the Tarxien Temples on Malta, like the one featured here.

We have experienced a year of tremendous disruption, but it’s moments like these that afford fresh starts and the chance for growth and discovery. As we figure out what’s next, why not take the chance to deepen your engagement with archaeology? In addition to reading the great stories in this magazine, explore archaeology in your local community, find the AIA Society closest to you, and peruse the many exciting resources, including those mentioned here, that are available on the AIA’s website, archaeological.org. It’s a treasure trove!

Laetitia La Follette

President, Archaeological Institute of America

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FROM OUR READERS

A NEW STYLE DOWN UNDER
Your report on the identification of a new rock art style in West Arnhem Land was excellent ("Where the World Was Born," May/June 2021). I visited the area and numerous rock art sites in 1999, so I appreciate the descriptions of the various other styles and where they all fit in the time line. Identifying the Maliwawa Style is a great achievement and fills a 4,000-year gap in the knowledge of the history of the land and its people.

*Magda Gagliardi
Newtown, CT*

REACHING CLOUD CITY

Thank you for the article on the Chachapoya people ("Mapping a City in the Clouds," March/April 2021). I made a then-epic journey to Kuelap in 1982. The multiday trip started from Trujillo, where we viewed the ruins of Chan Chan. Then we went to Cajamarca, site of the execution of Atahualpa, the last Inca emperor. We then crossed the deep Marañón River Valley, which splits the Andes' cloud-forested summits. Seeing the walls of the citadel at Kuelap after climbing the trail from the valley was

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amazing. Thank you again for the reminiscence of an epic journey.

*Chris Whitworth
Arcata, CA*

LIKE WATER FOR MILLET

I enjoyed Jarrett A. Lobell's article on the domestication of crops in East Asia ("You Are How You Cook," May/June 2021). As a former archaeologist who specialized in China, I developed a great appetite for the archaeology of ancient Chinese food. Xinyi Liu's work gives much clarity on the introduction, adoption, and consumption of various cereals in northern China and the fact that cooking traditions persist in some regions. Millet breads in the higher elevations of the Loess Plateau were my favorite, though I've been told that these days millet is considered a "poor man's food." Keep up the good work.

*Robert Jones
Louisville, KY*

TAX DODGE

The well-timed article "Ancient Tax Time" (May/June 2021) made me feel kinship with all the harried taxpayers of the past. Truly "pain shared is pain halved." In the "Royal Food Fund" section, Charlotte Diffe suggests that the high percentage of weed seeds in the carbonized wheat indicated lax oversight or deliberate skimping. May I suggest a different interpretation? Unless there is documentary evidence of contemporary complaint about such practices, it may be that to the Hittites, "weed"

seeds were perfectly acceptable "grain." Many cultures include a wide variety of seeds, including those we'd call weeds, in their diets. After all, they provide calories, too. Possibly the Hittites felt including these seeds in the grain mixture provided acceptable nutrition and contributed to the taste of their bread, porridge, or beer.

I am always excited when ARCHAEOLOGY magazine arrives; now my monthly time travel experience can begin! I have had the good fortune to visit Izapa. Thank you again for a not-to-be-missed magazine.

*Mary Jane Eichacker-Kaufman
Indianapolis, IN*

NEOLITHIC RORSCHACH TEST

I was somewhat dismayed by "Last Stand of the Hunter-Gatherers?" (May/June 2021). Scholarship seems to have taken a back seat to imagination in several interpretations of iconography at the site of Göbekli Tepe. Instead of the symbols creating fear, they might just as well represent the hunters' power over living things both great and small. Is the site unique? Findings at nearby Karahan Tepe suggest not. The article demonstrates how previous interpretations of the site failed to account for geologic forces at work and for Göbekli Tepe's relationship to similarly constructed neighboring settlements. Perhaps even the idea of a "boundary" between hunter-gatherer and Neolithic societies needs reevaluation.

*Mary Ann Unger
Henderson, NV*



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DIGS & DISCOVERIES

MEDIEVAL KOSHER DIET, ROMAN RIVER PORT, CHINESE TOMB OF MIRRORS...AND MUCH MORE

A CHALLENGING WORLD



There are many extremely challenging places to dig. In Luxor, Egypt, site of a newly discovered 18th Dynasty city (See “Lost Egyptian City,” page 18), temperatures often rise above 100°F. At the Yana Rhinoceros Horn site in remote northeastern Siberia, where scientists have found 31,000-year-old baby teeth belonging to a previously unknown human population, it can be as cold as -46°F. Some archaeologists regularly dive to the depths of the ocean. In the field, they can face venomous scorpions and active volcanoes. And there are the dangers of the modern world—the “Big Dig” was conducted in downtown Boston as a new highway was built overhead, and the recent coup in Myanmar has put archaeological work on hold.

But there are few places where more challenges collide than the Judean Desert in Israel and the Israeli-occupied West Bank, home of the Dead Sea Scrolls. The scrolls, the first of which were found in 1947 by a Bedouin shepherd in the Qumran Caves at the north end of the Dead Sea, contain the earliest known copies of biblical books, along with other Jewish religious writings, personal letters, and administrative documents dating from the mid-third century B.C. to the early second century A.D. For the past five years, Israel Antiquities Authority (IAA) archaeologists have investigated 580 known caves in the cliffs of the Judean Desert, where the logistical difficulties are unique, explains archaeologist and deputy director of the IAA Theft Prevention Unit, Eitan Klein. “Most of the caves can only be accessed using ropes due to their location in the middle of very steep cliffs,” he says. “The area is very remote

and there are communication problems that can cause safety issues.” Compounding these obstacles is the fact that some of the caves are in the occupied territories. According to international law, removing artifacts from these sites is illegal, which raises political and ethical concerns. Looters also pose an ever-present threat.

Located 260 feet below the top of a steep cliff, Cave 8 is in one of the Hever Valley’s most remote locations and has proved especially difficult for archaeologists to explore. The cave was first excavated in the 1950s and 1960s, when archaeologists discovered the skeletons of 40 adults and children, the remains of rebels who had fled to the area at the end of the Bar Kokhba Revolt, a Jewish rebellion against Roman rule from A.D. 132 to 135. During the recent campaign, the team unearthed coins bearing Jewish symbols, as well as spearheads and arrowheads, textiles, sandals, and lice combs belonging to the refugees in the cave. They also recovered 70 small pieces of parchment and a few scraps of





papyrus, 30 of which have writing on them, representing the first fragments of any biblical text to be uncovered in 60 years. “They took their most important belongings with them, including the scroll,” says Klein, “and they probably read those prophecies in the last hours of their lives to encourage their souls.”

Except for the name of God, which appears in Paleo-Hebrew, the late first-century B.C. text is written in Greek and consists of missing fragments from the Greek Minor Prophets Scroll, which was found in Cave 8 in the 1950s. Some fragments are blank, while others contain 11 lines from the Book of Zechariah as well as lines from the Book of Nahum. “The fact that the scroll is in Greek tells us that at least some of the rebels were fluent and comfortable using Greek for holy texts,” says Oren Ableman, curator-researcher in the Dead Sea Scrolls unit of the IAA. “It was a

real privilege to be the first person in two thousand years to read some parts of this scroll and a joy to find surprising text in the fragments.”

And therein lies another challenge. The Dead Sea Scrolls were written in multiple different languages over hundreds of years and, in the case of the biblical texts, copied by multiple scribes many times over. Sometimes more than one scribe worked on the same scroll. And sometimes mistakes were made by scribes copying the texts, creating even more difficulties. “For example, it was baffling to find the word ‘streets’ where all other manuscripts have the word ‘gates,’” Ableman says. “At first, I thought I might have made a mistake. However, eventually I concluded that the mistake wasn’t mine, but rather was made by a scribe in antiquity.”

—JARRETT A. LOBELL

THE SPIDER’S ON THE WALL

Farmers in Peru’s Virú Province accidentally unearthed a temple complex dating to between 1000 and 200 B.C. in an earthen mound. Although the farmers’ heavy machinery destroyed much of the site, a vibrant, multicolored mural was preserved on a wall of one of the complex’s adobe buildings. The compound was built by people of the Cupisnique culture who lived along Peru’s northern coast for some 2,000 years. At the mural’s center is a figure holding a ceremonial knife in one of its many limbs. The figure, which also appears

on Cupisnique stone vessels, has been interpreted as a spiderlike god. According to archaeologist Régulo Franco Jordán of the Wiese Foundation, this is the first known depiction of the supernatural being on a Cupisnique mural. The Cupisnique people relied on seasonal rains for their survival, and Jordán suggests that the temple’s location in a valley near the right bank of the Virú River connects the site to the worship of water deities, likely including the mysterious spider figure.

—BENJAMIN LEONARD

Spider mural, Virú Province, Peru



MIRROR, MIRROR

Western Han burial

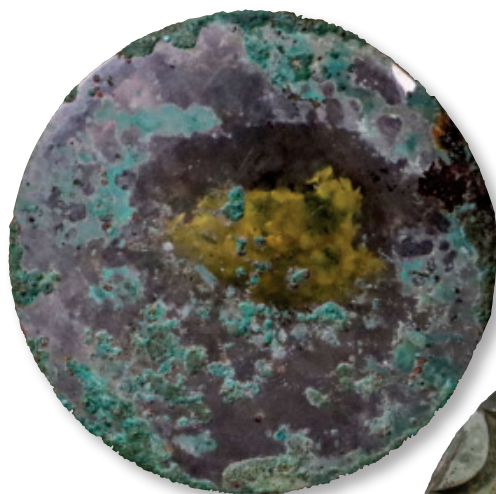


An array of 2,000-year-old bronze mirrors unearthed in a cemetery in the suburbs of Xi'an, China, has shed new light on funeral customs and daily life during the Western Han Dynasty (206 B.C.–A.D. 9). Among the 87 circular mirrors, which vary in size from three to eight inches in diameter, several can still reflect images. “They clearly show petals of flowers, or the brand name on your drink,” says lead researcher Yingpei Zhu from Shaanxi Academy of Archaeology. On the back of each mirror is a central knob surrounded by decorative images such as dragons and stars. According to Zhu, these mirrors belonged to ordinary citizens. In most cases, the mirror was placed near the head or chest of the tomb owner. In

one well-preserved tomb, four mirrors were placed in a stack, indicating the owner might have been wealthy—or just a devoted mirror aficionado.

—LING XIN

Bronze mirror with reflective surface

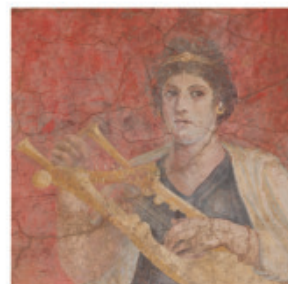


Bronze mirror



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RETURN TO SENDER

A team of researchers has virtually unfolded and read a letter that has remained unopened since it was mailed more than three centuries ago. Like many letters sent before the introduction of mass-produced envelopes in the early nineteenth century, this missive was intricately folded into a secure packet using a process called letterlocking. All that

is visible on its exterior is the name of its intended recipient: Pierre Le Pers, a merchant in The Hague.

The researchers scanned the packet using a high-resolution, high-contrast CT scanner designed for dentistry. The device is able to clearly image substances with very different densities, such as low-density paper and high-density, iron-containing ink.

The team developed an algorithm that, along with a 3-D image produced from the scanner's data, allowed them to determine how the paper was folded. They then "unfolded" it and flattened it into a 2-D image, enabling them to read the original letter without opening and potentially damaging it.

The letter is one of a trunkful of undelivered missives held by two postmasters in The Hague. It was dated July 31, 1697, and written by Le Pers' cousin, Jacques Sennacques, requesting a certified copy of the death notice of a man named Daniel Le Pers. Sennacques likely sought proof that Daniel Le Pers died before French inheritance laws had changed several years earlier. "Sennacques writes, 'You didn't answer my last letter!'" says Daniel Starza Smith, a lecturer in early modern English literature at King's College London. "Obviously, this one's gone unanswered, too. The poor guy probably ended up paying more inheritance tax than he needed to."

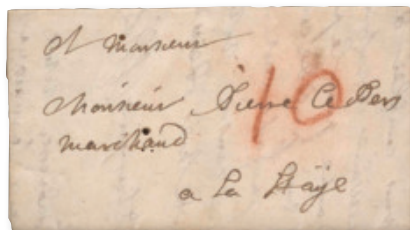
To see an animation of the unfolding of the letter, go to archaeology.org/unfolding.

—DANIEL WEISS

Seventeenth-century trunk of undelivered letters



Virtual unfolding of sealed letter



Sealed letter



IN THE NEWS:

Moissanite is a game changer... A hot trend in big bling— an alternative to diamond..."

— Today Show on NBC



A.

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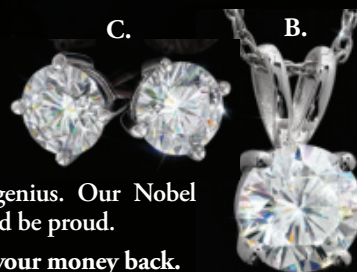
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THE COPPER STANDARD

For millennia, hunter-gatherers living around Lake Superior created utilitarian objects such as projectile points, knife blades, and awls out of copper. Today, these Archaic period societies are collectively referred to as the Old Copper Complex (OCC). For reasons not entirely clear, the OCC emerged early in the Archaic period (9000–1000 B.C.) and disappeared sometime between 5,000 and 3,500 years ago. A range of dates has been suggested for when the OCC began. To better pin down when the OCC emerged, a team led by geologist David Pompeani of Kansas State University evaluated 53 radiocarbon dates associated with copper artifacts and ancient copper mines. They found that dates from wood and rope embedded in objects such as projectile points were most likely to reflect the time during which the objects were used, because these materials were

preserved in their original context. “The oldest reliable age from embedded material in a copper artifact is about 8,500 years old,” says Pompeani. “Many other samples of embedded material have ages between 8,000 and 5,000 years ago.”

As to why one of the world’s oldest metalworking traditions was abandoned, archaeologist Michelle Bebbler of Kent State University believes that copper blades and projectile points did not offer enough of an advantage over stone versions to warrant the greater effort involved in making them, particularly as populations grew and resources diminished. People needed more time to hunt and defend their territory, Bebbler suggests, and may have repurposed copper for use in trade or as gifts.

For more on the Archaic copper trade, see “Rediscovering Archaic America” on page 48.

—MARLEY BROWN



Copper artifacts

RED CARPET TREATMENT

A member of the Pazyryk culture, a nomadic Scythian people who once roamed the mountainous terrain where present-day Russia, Kazakhstan, and Mongolia



Pazyryk Carpet

meet, was buried nearly 2,500 years ago with a textile featuring a rich tableau of lotus buds, deer, and cross-shaped figures. The textile, which measures roughly six feet on a side and was woven with more than 1,250,000 knots, is the world’s oldest known pile carpet. Since it was discovered preserved under a layer of permafrost in 1947, researchers have marveled at the carpet’s enduring hues of yellow, blue, and red.

A team of scientists led by Andreas Späth and Rainer Fink from Germany’s Friedrich-Alexander University Erlangen-Nuremberg recently attempted to figure out how Pazyryk artisans or their trading partners produced such intense colors. They experimented with a method of fermenting wool before dyeing it. “The microorganisms that grow during fermentation eat up fat layers between the cuticle scales in wool fibers,” says Späth. He explains that these fat layers block the diffusion of most natural pigments into the fibers. When the fat layers are gone, that diffusion is strongly enhanced. The team was able to observe this effect using a high-resolution X-ray microscope on both the wool fibers they dyed in their experiment and those from a tiny sample of the Pazyryk carpet, suggesting that the fermentation technique was used to create the carpet’s dazzling colors.

—MARLEY BROWN



Vihara, Jharkhand, India



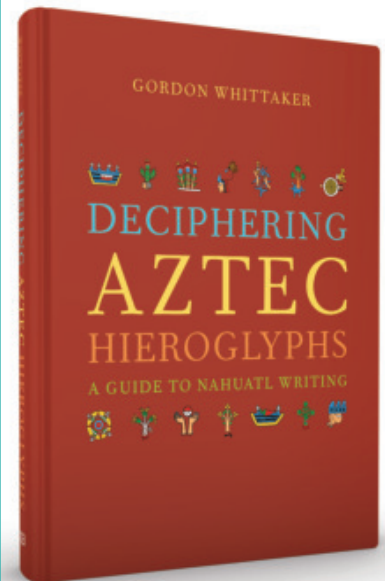
Buddha and Buddhist deities

BUDDHIST RETREAT

Archaeologists in the eastern Indian state of Jharkhand have unearthed a small vihara, an early type of Buddhist monastery. A team from the Archaeological Survey of India (ASI) investigating several mounds in a hilly area found a Buddhist shrine in one of them and the vihara in another. According to Rajendra Dehuri, ASI deputy superintending archaeologist, the monastery includes six rooms that open onto a wide veranda. Also found at the site were sculptures of Gautama Buddha, as well as the Buddhist deities Avalokiteshvara and Tara. The structure appears to have been built between the eighth and eleventh centuries A.D.

—GURVINDER SINGH

A portal to the ancient hieroglyphic script of the Aztec Empire.



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—**María Castañeda De La Paz, Universidad Nacional Autónoma de México**



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TUBMAN'S TRAINING GROUND

Excavation site,
Blackwater National
Wildlife Refuge,
Maryland



The site of the cabin where Harriet Tubman lived with her family as a young adult in the early 1840s has been located in the Blackwater National Wildlife Refuge on Maryland's Eastern Shore. According to the will of his former owner, Tubman's father, Ben Ross, was to be freed from slavery and granted 10 acres in the area. The precise location of his plot, however—



1808 coin

referred to as “Old Ben’s Place” in later land deeds—was unknown.

A recent excavation led by Julie Schablitsky, project director and chief archaeologist with the Maryland Department of Transportation, has unearthed a range of evidence of the cabin. This includes a coin dating to 1808 found on an old road leading to the site, ceramic sherds imprinted with dishware patterns popular in the 1820s to 1840s, and bricks, nails, and hinges thought to have been part of the cabin itself. While living there, Tubman likely gained important skills for her career as a conductor on the Underground Railroad. “The area is wet, swampy, full of bugs, and wooded,” Schablitsky says. “She was able to learn to navigate brutal

terrain, providing confidence to lead her people through such harsh environments.”

Tubman may also have gained pointers on making her way farther afield from free Black mariners who transported wood that her father felled and sold to shipbuilders in Baltimore.

—DANIEL WEISS

ANCHORS AWEIGH

Divers exploring a section of the River Wear west of Sunderland, England, retrieved an assortment of Roman artifacts and nine ship anchors that had been buried in the riverbed for 2,000 years. Weighing up to 40 pounds, the stone anchors resemble other Roman examples found elsewhere in Britain, but these are the first to be discovered in a river and not a maritime context. Archaeologist Gary Bankhead believes the anchors may indicate the location of a small harbor or unloading zone once used by the Romans. “Seagoing ships would have been unable to go any further upstream due to the shallow depth of water at low tide, so cargo would have had to be transferred to smaller boats,” says Bankhead. The River Wear was likely an important supply route used by the Roman army to provision their forts farther upriver during their campaigns against northern British tribes.

—JASON URBANUS



Roman anchors, Sunderland, England



Roman amphitheater before clearing, Mastaura, Turkey



Arched stone passageways



Amphitheater remains after clearing

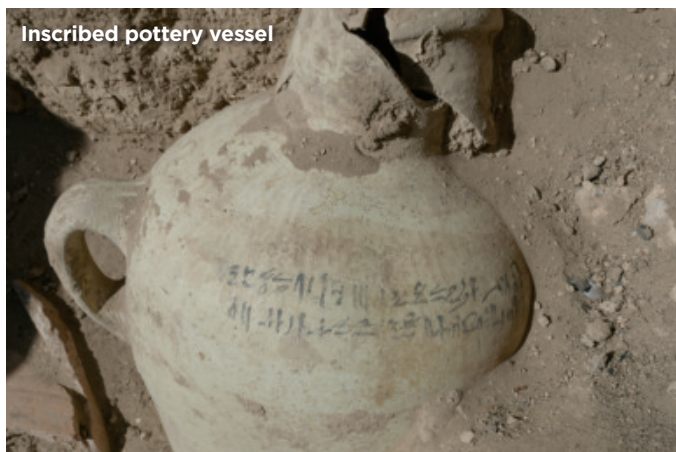
IN THE ANATOLIAN ARENA

During a survey of the ancient city of Mastaura in western Turkey, archaeologists happened upon the stone arches and seats of a large Roman amphitheater, most of which remains underground. Archaeologists Sedat Akkurnaz of Adnan Menderes University and Mehmet Umut Tuncer of the Aydın Provincial Directorate of Culture and Tourism think the arena was built around A.D. 200, when the city flourished under the largesse of the Severan emperors, who ruled from A.D. 193 to 235. With an estimated seating

capacity of 15,000 to 20,000 people, the amphitheater was one of the only such grand structures in Anatolia, the researchers say. It probably attracted spectators from nearby cities for the bloody gladiator bouts and wild animal fights that took place there. As at the famed Colosseum in Rome, rooms beneath the building's outer walls likely served as waiting areas for combatants and private entertainment spaces for elite audience members.

—BENJAMIN LEONARD

LOST EGYPTIAN CITY



Inscribed pottery vessel

A team of excavators led by Egyptologist Zahi Hawass has uncovered the city where the people who worked in the temples of ancient Egypt's New Kingdom-era spiritual center at Luxor lived. The city's ancient name was "the dazzling Aten," a reference to a newly ascendant solar god. The team found a large bakery that may have been used to feed workers, as well as an administrative and residential district that was surrounded by a zigzag wall, a rare architectural



Scarab and other decorative amulets



Mudbrick zigzag walls, Luxor, Egypt

style for the time. The walls' mud bricks bear the seal of the pharaoh Amenhotep III (r. ca. 1390–1352 B.C.), who conducted an ambitious building program at Luxor.

—ZACH ZORICH

LAWS OF THE LAND

At least two families in Oxford, England, may have followed a kosher diet more than 900 years ago. Archaeologists have uncovered remnants of two adjoining houses that were owned by Jewish families in the late eleventh and early twelfth centuries, according to medieval census records. In a privy attached to the houses, researchers uncovered fragments of cookware and thousands of animal bones. A team led by University of Bristol archaeologist Julie Dunne conducted lipid-residue analysis to determine whether the families observed Jewish dietary



Medieval jar



Excavations, Oxford, England

laws. "During the period these families were living at the site, we see a total absence of pig bones and an abundance of fowl and kosher fish remains," says Dunne. Chemical traces detected on the sherds, she adds, suggest that the vessels were used to process ruminants, including cows and sheep, but not pork or dairy products. According to Jewish dietary law, it is forbidden to eat pork or shellfish, or to mix meat and dairy products in the same container. By contrast, vessels from an earlier Anglo-Saxon assemblage recovered at the site, and those unearthed at a nearby medieval site, appear to have contained both ruminant and nonruminant animal products. This suggests the families had distinct cooking and eating habits.

—MARLEY BROWN



Islamic bathhouse, Seville, Spain



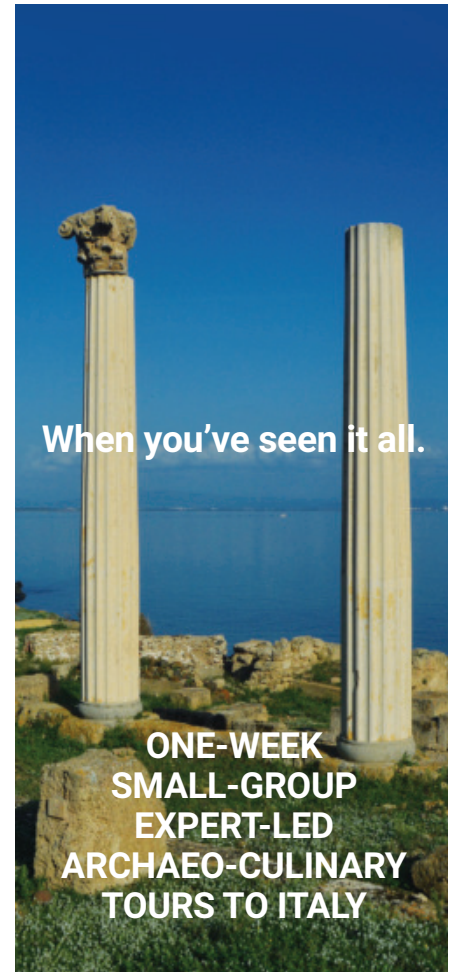
Decorated ceiling, bathhouse

BATHING AT THE BAR

Workers renovating a popular tapas bar in Seville, Spain, were surprised to encounter the remains of an Islamic bathhouse dating to the twelfth century, when the Almohad Caliphate ruled Andalusia. Soon after construction began, the crew discovered the painted walls of the long-forgotten structure concealed behind the restaurant's plastered walls. Covered from floor to ceiling in well-rendered red-and-white geometric designs, the ornate bath complex was also adorned with 88 skylights shaped like stars, octagons, and rosettes.

Thanks to historical records, archaeologists knew a bath complex was once located in the busy neighborhood, close to the Seville Cathedral and the city's Great Mosque. They assumed it had been torn down centuries ago. It turns out it remains almost completely intact but was hidden from view when the building was converted into a hotel and restaurant in the early twentieth century.

—JASON URBANUS



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ZAKROS, GREECE

Some 3,500 years ago, at the mouth of a harbor on the far eastern end of Crete, a community of Minoan traders built a complex of banquet halls, storage rooms, kitchens, courtyards, and pools. This hub at the site of Zakros is known as a palace, but the term is somewhat of a misnomer both at Zakros and at other contemporaneous Minoan settlements. According to archaeologist D. Matthew Buell of Trent University, there is no evidence from any Minoan site to suggest that these palaces housed rulers or politicians. Instead, Buell says, they are better understood as multi-purpose centers where all manner of commercial, political, religious, industrial, and



social activities may have taken place. The Zakros palace covers just under an acre of land and featured some 150 rooms arranged on two levels around a central court. During excavations that have taken place intermittently since the 1960s, 13 tablets written in a script known as Linear A have been discovered there. Linear A has yet to be deciphered, but these texts are thought to contain some sort of tabulations, likely recording taxes or tribute.

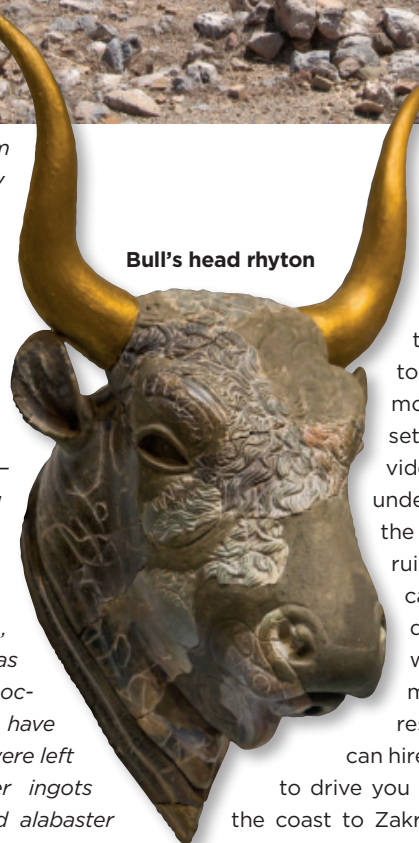
Researchers have uncovered little evidence of how Minoans organized themselves religiously and politically. However, architecture at sites including the palace at Zakros can provide some clues. "Minoans reserved spaces for elites," says Buell, "but they also emphasized community interaction in large public areas as a means of social and political organization." Zakros palace officials collected olive oil and other agricultural products in the hinterlands and stored them within the palace



before redistributing them to the broader community during ceremonial events and shipping them out to trading partners across the sea. Buell believes the Minoan mariners of Zakros parlayed their eastern port location—the only safe refuge along a notoriously rough coast—into particularly strong commercial relationships with the Near East and North Africa. Zakros was destroyed around 1450 B.C., after which the palace was abandoned and never reoccupied. Archaeologists have found luxury goods that were left behind, including copper ingots from Cyprus, faience and alabaster from Egypt, ivory from Syria, and many Greek rhytons, or pouring vessels made out of imported materials such as obsidian. One of these vessels was carved out of the mineral chlorite in the shape of a bull's head, whose wooden horns were likely once wrapped in gold foil.

THE SITE

Many of the artifacts recovered from Zakros are in the Heraklion Archaeological



Bull's head rhyton

Museum, which also provides an exhaustive introduction to Minoan civilization. Just outside Heraklion, at Knossos, visitors can take a guided tour of perhaps the most powerful Minoan settlement, which provides a framework for understanding some of the less well-explained ruins at Zakros. Rent a car in Heraklion, and drive east to Sitia, which boasts its own museum and excellent restaurants. There you can hire a local tour operator to drive you the hour or so down the coast to Zakros. Manual transmission aficionados who enjoy negotiating steep inclines and roads with no shoulder may prefer to drive themselves.

WHILE YOU'RE THERE

Some 20 miles up the coast from Zakros you'll find Vai Beach, one of Crete's most beloved spots to catch the island sun. The beach also features Europe's largest natural palm forest.

—MARLEY BROWN

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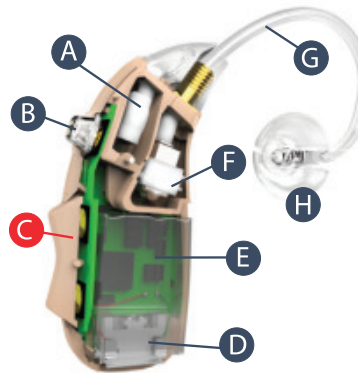


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WASHINGTON: Salmon is an excellent source of lean protein, but eating too much of it isn't healthy. It has long been thought that Indigenous populations of the Pacific Northwest ate an almost exclusively salmon-based diet yet were somehow unaffected by "salmon starvation," a toxic condition caused by an overly protein-intensive diet. A new study suggests that Native communities were well aware of these nutritional pitfalls and relied on trade, hunting, and agriculture to supplement their diet with acorns, root crops, and fatty marine mammals.



NEW HAMPSHIRE: As might be expected, archaeologists excavating the privy of a 19th-century house located on the campus of Dartmouth College discovered preserved human waste. What was surprising was that the property's wealthy owners suffered from parasitic tapeworms, a condition usually afflicting individuals of lower socioeconomic status. The homeowners did, however, have the means to seek a remedy. Among the toilet's debris were 12 medicinal bottles from a Rhode Island apothecary that marketed a cure for digestive ailments.



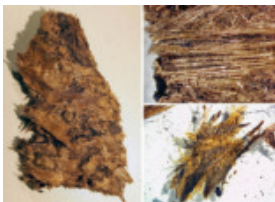
PERU: The culture that inhabited the Supe Valley between 3000 and 2000 B.C. is often considered the first city-building civilization in the Americas, having established urban centers with monumental pyramids and circular plazas. A recent project has determined that the location and orientation of these buildings was influenced by annual astronomical events—especially the moonrise's southernmost position on the horizon—which coincided with cyclical changes such as the arrival of the rainy season, the beginning of winter, or the start of the planting season.



NIGERIA: The Nok people of central Nigeria are well known for their terracotta figurines and early ironworking capabilities. They were also perhaps the earliest systematic collectors of honey in West Africa, which they possibly used for nutritional and medicinal purposes. The presence of beeswax was detected in a number of clay pots, some dating to 1500 B.C. The Nok may have used the vessels as hives, to heat waxy honeycombs in order to extract the honey, or to produce honey-based alcoholic beverages.

ENGLAND: Authorities today have technological tools at their disposal to help identify forged documents. Hundreds of years ago, English officials had at least one—sheepskin. Analysis of hundreds of historical legal documents revealed that beginning in the 13th century, sheepskin parchment was overwhelmingly preferred by lawyers to calfskin or goatskin. Because of sheepskin's high fat content and unique texture, any attempt to erase or change what was written on it left visible blemishes and obvious signs that fraud might have been committed.





SWEDEN: Excavations over the past two centuries have shown that Viking warriors were often buried with supplies to aid them on their journey to the afterlife: weapons, tools, food, and cooking utensils. Two high-status men entombed at the site of

Valsgärde during the 7th century had their voyage eased even further. They were buried with down-stuffed pillows and bedding, the oldest evidence of its kind yet found in Scandinavia. Feathers from a variety of species were used, including ducks, geese, chickens, grouse, and even eagle owls.

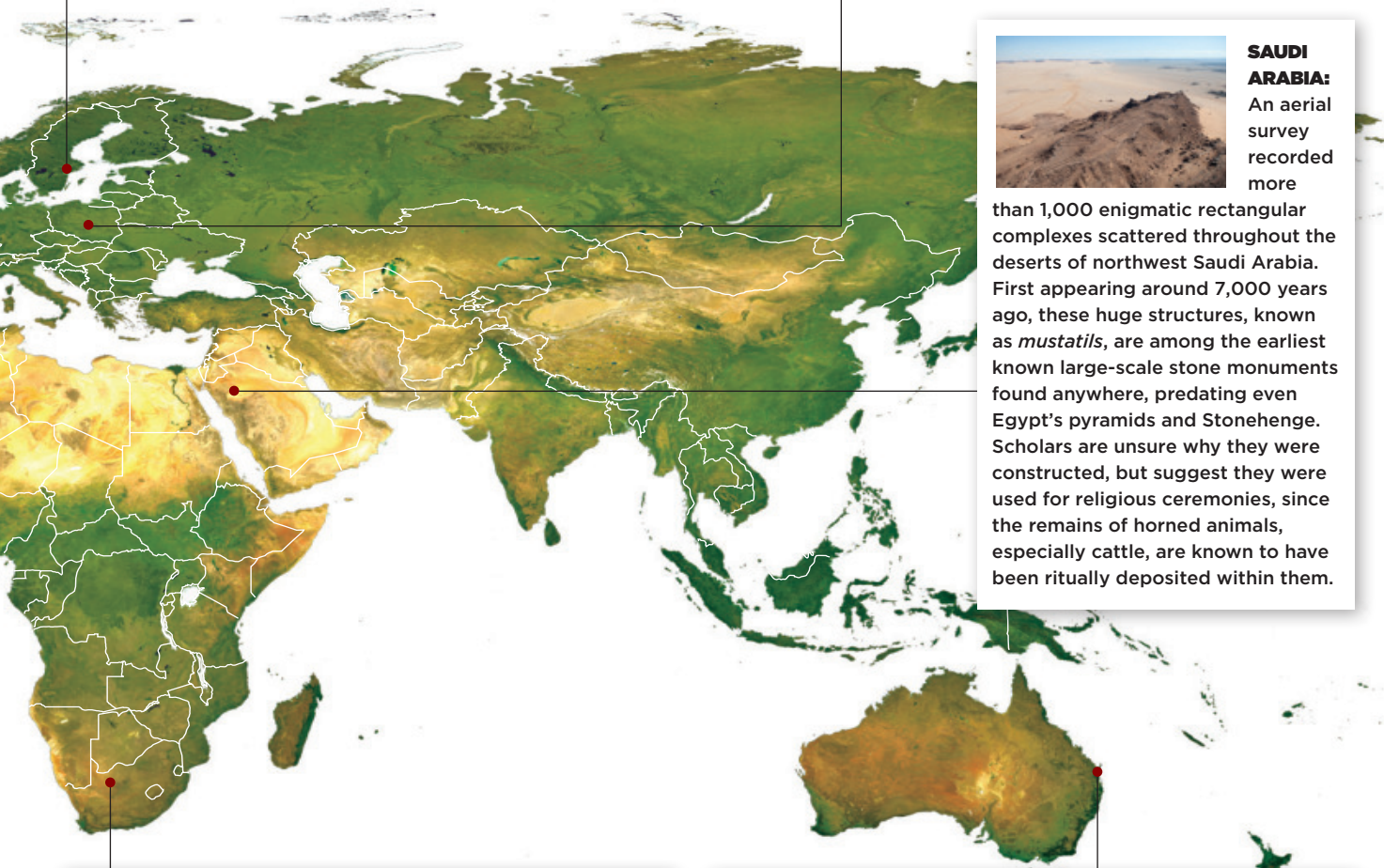


POLAND: Good oral hygiene was not invented by modern-day dentists, but rather has been practiced for tens of thousands of years—and not just by *Homo sapiens*. Enhanced imaging of a 46,000-year-old Neanderthal tooth recovered from Stajnia Cave revealed that the upper premolar had a distinctive groove worn into it. This was likely caused by a thin cylindrical object such as a bone or wooden toothpick that was used repeatedly to clean the area and remove food residue.



SAUDI ARABIA: An aerial survey recorded more

than 1,000 enigmatic rectangular complexes scattered throughout the deserts of northwest Saudi Arabia. First appearing around 7,000 years ago, these huge structures, known as *mustatils*, are among the earliest known large-scale stone monuments found anywhere, predating even Egypt's pyramids and Stonehenge. Scholars are unsure why they were constructed, but suggest they were used for religious ceremonies, since the remains of horned animals, especially cattle, are known to have been ritually deposited within them.



SOUTH AFRICA: New dating of sediments from the Kalahari Desert's Wonderwerk Cave suggests the shelter may be the oldest home ever inhabited by our human ancestors. Researchers believe the cave was occupied as long as 1.8 million years ago—the presence of hominins is indicated by the remains of primitive stone tools.

Burned bone and ashes also found at the site may be the earliest known evidence of deliberate use of fire, around a million years ago.



AUSTRALIA: The boomerang may be Australia's most recognizable cultural artifact. After being hurled, the crescent-shaped hardwood objects will, hypothetically, return to the thrower. While Aboriginal communities have been using boomerangs for hunting

and fighting for millennia, new research indicates they had other purposes as well. Microscopic analysis of wear patterns on more than 100 boomerangs from sites across the continent suggests they were frequently used to shape stone tools. They could also have been used for making fire or playing music, or as digging implements.



Clay tablets found in Ugarit, clockwise from above: A letter from the Hittite king Tudhaliya IV to his counterpart in Ugarit offers details on horse shipments, with a circular royal seal as a signature; a legal text in Mesopotamian cuneiform dates from the reign of King Niqmaddu II; a tablet in alphabetic cuneiform tells the myth of the death and rebirth of the city's supreme god, Baal; and a tablet from an aide to the king of Beirut informs the king of Ugarit about a shipment of wood.

The Ugarit Archives

Thousands of cuneiform tablets written in a distinctive script tell the dramatic story of a Bronze Age merchant city in Syria

by ROGER ATWOOD



URTENU WAS A LATE Bronze Age merchant of some status. From his town house in Ugarit, on the coast of Syria, he ran a trading firm that conducted business on behalf of the state. Beginning sometime before 1200 B.C., he kept letters, accounting ledgers, and administrative texts documenting the export of copper ingots, wood, and other goods from the interior of Syria and the import of wares from Cyprus and Egypt. Urtenu also sent and received diplomatic letters and had an impressive list of contacts. Among the 650 baked clay tablets found in the ruins of his house thus far, archaeologists have turned up missives to and from the kings of Egypt, Assyria, Beirut, and the Hittite realm in what is now Turkey. Urtenu corresponded with these potentates in the name of the king of Ugarit. He seems to have been a cultured man, too. Archaeologists found passages from the ancient Mesopotamian poem the *Epic of Gilgamesh* in his house, written, like almost all surviving texts in Ugarit, on densely inscribed tablets.

Between 1200 and about 1185 B.C., Urtenu's correspondence took on a more ominous tone. Polite requests for help turned into increasingly desperate pleas as severe drought and famine began to upend life in the kingdoms and city-states around Ugarit. The tablets speak of *biru*, "hunger" in the Akkadian language, which was widely spoken in the Levant, spreading across



the landscape. "If there is any goodness in your heart, then send even the remainders of the [grain] staples I requested and thus save me," pleads a Hittite official. Food shortages were becoming dire. "In the land of Ugarit there is a severe hunger. May my Lord save it, and may the king give grain to save my life...and to save the citizens of the land of Ugarit," wrote Ugarit's king Ammurapi (ca. 1215–1190 B.C.) to the Egyptian pharaoh Seti II, who ruled from about 1200 to 1194 B.C.

War was also coming. One letter, likely one of the archive's last and probably never sent, speaks of invaders appearing off the coast and establishing a beachhead at Ra'su, barely five miles from Ugarit. In the letter, Ammurapi begs the viceroy of the Hittite vassal city-state of Carchemish, "Send me forces and chariots and may my lord save me from the forces of this enemy!" The enemy was almost certainly the so-called Sea Peoples, maritime marauders whose identity remains unclear and who overran Ugarit and burned it to the ground. It did not fall alone. At the same time, across the eastern Mediterranean, cities and trading networks were threatened by drought, invasion, mass migration, and possibly local insurrection. Egypt's dynastic system survived a cataclysmic battle with the Sea Peoples in 1177 B.C., but Mycenae and Pylos in Greece, and states in Cyprus, Canaan, and Turkey were all obliterated in what scholars have termed the Late Bronze Age collapse.

The Urtenu archive, which was discovered in 1973 and is



An excavated quarter of Ugarit shows the crowded, mazelike streets, alleys, and residential properties of the cosmopolitan ancient city.

still trickling into publication, documents life in Ugarit from its moment of greatest plenty through the subsequent famine and violence that engulfed it. From the 1930s to the 1970s, archaeologists excavating the ruins of Ugarit's royal palace, where Urtenu's patron ruled, unearthed more than 1,000 tablets, but no archive yet discovered has the range and impact of Urtenu's trove. "The archive allows us to see clearly what formerly we could only glimpse," says archaeologist Yoram Cohen of Tel Aviv University. "We see how these semiofficial traders operated and how they acted as engines for the state of Ugarit. And it shows how the enemy came from the sea and destroyed the city at one go." Like most Ugaritic scholars, Cohen has never visited the site, which was partly covered by a Syrian military base until the 1980s and which has been difficult for non-Syrian archaeologists to visit since civil war broke out in 2011. French epigraphers published translations of 130 tablets from Urtenu's house in 2016, and Cohen believes there are perhaps as many as 100 more sitting in storerooms and museums in Syria, awaiting decipherment. Syrian archaeologist Khozama al-Bahloul, current codirector of the research project at Ugarit, says that excavation has continued uninterrupted throughout the civil war, and that the fighting has not damaged the site. Recently, she has been excavating the city's ancient military defenses, including the fortifications and ramparts that proved unable to stop the Sea Peoples' onslaught.

During nearly a century of excavation, archaeologists have discovered nine major tablet stores in Ugarit, some in administrative buildings, others in what were clearly private homes. The archives are spread around the city and reflect a culture of meticulous, even obsessive, record-keeping as Ugarit's trade ties grew and flourished. The archives have also illuminated how these trade networks and writing developed side by side. Ships and donkey caravans that carried textiles or grains also carried skilled laborers, including sculptors, potters, metallurgists, and carpenters—along with scribes from Egypt and Iraq whose writing systems were among about a half dozen used in Ugarit. Sumerian cuneiform and Egyptian hieroglyphs appear in the same archives, along with a Cypro-Minoan script that modern scholars have not been able to decipher. The most common form of writing the scribes of Ugarit employed was Babylonian cuneiform, which has turned up in all the archives, even sometimes on the same tablet with other scripts.

In the last century before the seaborne invaders leveled the city, Ugarit's residents made their own contribution to the list of scripts in use, adding alphabetic cuneiform, which they quickly adapted to represent their spoken language, Ugaritic. It was a unique innovation that presaged the dominance of alphabetic scripts in the centuries to come and the decline and eventual disappearance of other writing systems. "By the thirteenth century B.C., there are five writing systems and eight languages all present at the same time in this one cosmopolitan city," says Carole Roche-Hawley of France's National Center for Scientific Research (CNRS), who has worked extensively in Syria. "One of them is the script they invented, and they write their own spoken language, as well as all their local literature, in this new script."

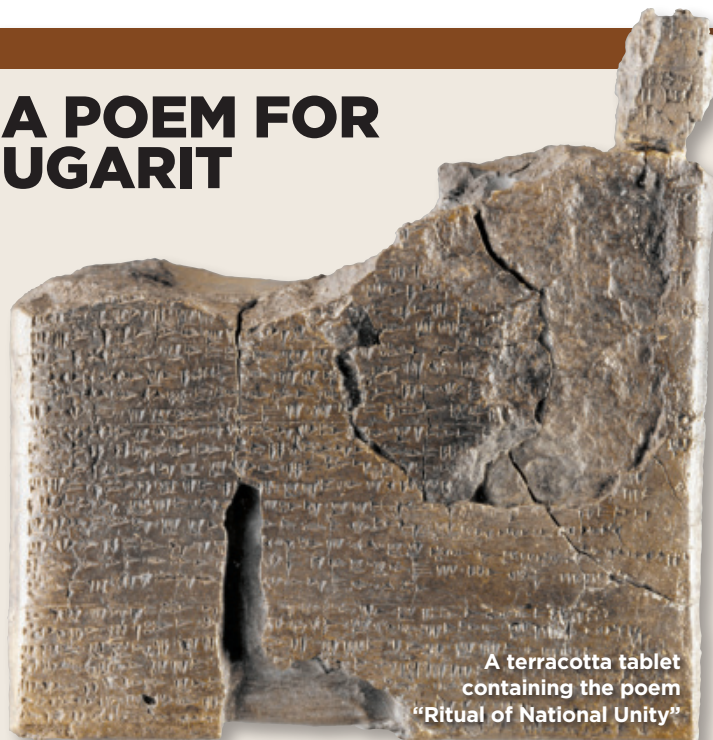
WOMEN IN UGARIT

Ugarit's culture was distinctive in ways apart from its homegrown script. Women had an unusual degree of autonomy compared to other contemporaneous cultures, and were allowed to own property, participate in rituals, and, says archaeologist Yoram Cohen of Tel Aviv University, were almost certainly trained as scribes. A census document shows women as the heads of households, listing among the residents of one neighborhood "a preeminent wife in the house of Artthb; a wife and her two sons in the house of Iwrpzn; a wife and an unmarried woman in the house of Ydrn; [and] two preeminent wives and an unmarried woman." Ugarit's queens were also in charge of their own estates and had prominent diplomatic roles. One queen, named Thariyelli, personally sacrificed a bull on the city's acropolis, an honor usually reserved for men. Tablets also record the scandalous divorce of Ammistamru II (r. 1260–1235 B.C.) and his wife, a niece of the Hittite king. Ammistamru's wife, whose name does not appear, was accused of causing him some unspecified "trouble," banished from the city, and then ordered back to be subjected to further punishment. —R.A.

THE CITY OF UGARIT dates from the beginning of the second millennium B.C., when Amorite tribes are believed to have migrated from the arid Syrian interior into the area, where they mixed with Canaanite coastal peoples. Lacking military power but possessing a good harbor, the residents of Ugarit built up their wealth by trading wood from timber forests in coastal ranges. Tin from Afghanistan, dried fish from the Nile, Mycenaean pottery from mainland Greece, and furniture crafted from Syrian wood all passed through Ugarit's harbor, where they were tallied up on clay tablets and then bartered at ports across the Mediterranean. By 1400 B.C., Ugarit stood at the boundary between the two superpowers of the day, Egypt and the Hittite Empire. Trade ties flourished among the eastern Mediterranean's centralized, palace-based states, all of whom jockeyed for a strategic and commercial edge, a state of affairs that Ugarit was in prime position to take advantage of. The city's rulers adroitly played the Egyptians and Hittites against each other. "Hittite-Egyptian relations went back and forth between friendliness and fighting throughout the Late Bronze Age," says archaeologist Kevin McGeough of the University of Lethbridge. "Ugarit acted as a pivot both between them and between the Aegean and Mesopotamian worlds. They all interacted and came together there."

The first archaeologists at Ugarit unearthed evidence of Egyptian influence and concluded that it had been an Egyptian colony, but later research showed that all those scarabs, statuettes, and sphinxes had been found only in high-status contexts. Ugarit's elites, it appeared, liked Egyptian-made

A POEM FOR UGARIT



A terracotta tablet containing the poem "Ritual of National Unity"

Of the thousands of texts from Ugarit, none shows the ancient Syrian city's vibrant cosmopolitanism and civic spirit like the poem modern translators have called "Ritual of National Unity." The text—fragments of which have been found inscribed in baked clay tablets using Ugarit's own alphabetic script in six different parts of the city, suggesting it was widely known—includes specific references to nations that traded with Ugarit and whose citizens lived in the city. It decries slights against these foreigners and against the city's most marginalized citizens.

The poem begins with an appeal to the "rectitude of the son of Ugarit"—or daughter, in some versions. It then calls for "the well-being of the foreigner...be it according to the statement of the Hittite / Be it according to the statement of the Alashian." Hittites and Alashians were Mediterranean peoples who traded with Ugarit and are known from other texts to have had migrant communities in the city. Similar shout-outs follow for other groups, some obscure today. The poem then pays homage to "your oppressed ones [and]... your impoverished ones," and some versions call for "the well-being of the woman." Scholars have interpreted those lines as an expression of consciousness of class and gender rarely documented so clearly in ancient texts. The poem also includes what appear to be stage directions. "Here is the donkey!" it says, perhaps a prompt for someone to lead a donkey into view. The work was obviously meant to be performed, says Philip Boyes of the University of Cambridge.

Evidence from other tablets found in the city points to suspicion of foreigners, and "Ritual of National Unity" might have been less a celebration of diversity than a reflection of a belief that mistreatment of foreigners and the poor could bring bad consequences. "It shows social consciousness," says Andrew Burlingame, a professor of Hebrew at Wheaton College, but also a belief that "mistreatment of an individual or group of nonlocal origin could interfere with the favor of the city's gods."—R.A.

finery. By combining the information gathered from nearly a century of archaeological research with that from the more than 5,000 tablets that have been excavated, translated, and published thus far, scholars have been able to reconstruct Ugarit's history of Bronze Age mercantilism and power politics in close detail. People arriving by sea passed through a monumental gatehouse into the city and soon saw the city's royal complex, spread out over more than two acres. A temple to Ugarit's patron deity, Baal, towered 150 feet over the city, and may have also been used as a lighthouse. Inside the temple, priests ran their fingers over ivory replicas of cow livers inscribed with incantations, hoping to read the future. Almost to the end, the city's residents remained fascinated with Egypt. A tablet dating to around 1210 B.C. records that the king of Ugarit asked the pharaoh Merneptah (r. ca. 1213–1203 B.C.) to send his artists to chisel an image of the Egyptian ruler in stone. Certainly, replied Merneptah, "as soon as they finish...fulfilling their duty to the great gods of Egypt," by which he meant working on his own monuments. Ugarit's upper echelons thought nothing of dividing their loyalties between Egypt, their cultural lodestar, and the Hittite Empire, to which they owed political allegiance.

Outside the royal precincts, the city was a warren of streets and alleys, some barely three feet wide, with multistory apartment blocks where neighbors shared common olive-oil presses and textile-weaving equipment. Bards recited epic poems as popular entertainment. (See "A Poem for Ugarit," this page.) Local craftspeople made imitation Mycenaean and Egyptian pottery for the masses, while the upper class had the real thing.

Perhaps surprisingly for such a well-connected figure, Urtenu lived in one of these out-of-the-way neighborhoods. The French and Syrian archaeologists who have excavated his house since 1986 have found that it was constructed with cobblestones instead of higher-class ashlar masonry, although it did have an ashlar floor. "Had there been no tablets, the archaeologists would have said this is a mediocre house," says Robert Hawley, who teaches Ugaritic studies at the Practical School of Higher Studies in Paris. Scholars have puzzled over why such an ordinary dwelling was the site of so much official correspondence. The answer may be that the distinction between private and official activities was blurry, and that Urtenu's trading firm was overseen, at least nominally, by queen Thariyelli's son-in-law Shipti-Baal, who was a wealthy merchant. (See "Women in Ugarit," page 27.) Tablet stores have been found in four other private homes, all dating from roughly the same period, around 1200 B.C., leading Roche-Hawley of CNRS to theorize that unsteady or untested leadership at the palace might have led courtiers to steer official business to domestic spaces. "It's a period of transition at the end of the thirteenth century when the king dies and we have a new



Objects from across the eastern Mediterranean found in Ugarit, clockwise from top left: a bowl with Egyptian motifs excavated in the city's harbor; a carnelian scarab imported from Egypt; a Mycenaean ceramic ceremonial vessel in the shape of an animal head imported from Greece; a fragment of an alabaster vase bearing the cartouche of an Egyptian pharaoh; a bronze figurine of a falcon god with an Egyptian crown; and a seal with an inscription in the Hittite language refers to Ugarit's political ties to that empire in modern-day Turkey.



Ugarit's royal palace dominated the city's western half. Once inside the palace, visitors would have entered this reception hall featuring a small square pool.

king—a young king—so people from the administration are taking business outside the palace,” says Roche-Hawley. “There are more letters addressed to the king at Urtenu’s house than were found at the palace. That says something.”

URTENU’S HOUSE WASN’T only used for storing official records. It may also have functioned as a scribal school, where people learned to read and write Babylonian cuneiform and Ugarit’s own alphabetic script. Archaeologists have discovered pedagogical tablets there, with both scripts side by side, similar to those found in larger quantities elsewhere in the city. Ancient scribes used those tablets to learn the new script and, in the 1930s, archaeologists did so again to decipher Ugaritic.

The local script appears abruptly and fully formed on tablets, almost overnight in archaeological terms, says Philip Boyes, a philologist at the University of Cambridge. It probably arose from a deliberate policy of Ammistamru II’s (c. 1260–1235 B.C.) or another king in the second half of the thirteenth century, as “a top-down project imposed by fiat,” says Boyes, although he adds that the new script may have been tested on perishable materials before being etched in clay. Some scholars compare the move to Kemal Atatürk, the founder of modern Turkey, imposing the Latin alphabet on Turkey in the 1920s, or the state of Israel reviving ancient Hebrew to create a national language. Ammistamru’s motives are not as clear. Cuneiform, in which each character represents an individual word, was a flexible script that had existed, in different forms, for more than 1,000 years. It could be adapted to almost any language, including Semitic ones such as Ugaritic or Indo-European tongues such as Hittite.

But with about 650 different characters, cuneiform was hard to teach, and some scholars believe Ugarit’s thriving, quasi-official merchant class wanted a simpler way in which to record transfers of goods and movements of laborers and skilled artisans.

Alphabetic scripts had begun to be used a few centuries earlier in southern Canaan and the Sinai, but had not spread far. They were based on pictographic symbols associated with sounds. For example, a symbol that resembles a human head represented a sound like “r” because local Semitic words for head, such as *rosh* and *ras*, began with that sound. These scripts had only about 20 characters, enough to represent almost any consonant used in local languages, and were simple enough for even a child to learn. Exactly how Ugarit’s merchants came across the alphabetic concept is unknown, but with typically Ugaritic pragmatism, they used cuneiform signs as letters and created a script with 30

characters. These included written vowels, which earlier alphabetic systems lacked. “Alphabetic cuneiform could be considered the first alphabetic script to take account of vowel differences,” says Boyes. The new vowel renderings were little more than breathing marks next to consonants, “closer to syllabic signs rather than vowels per se,” he adds. But a key innovation had taken place—an alphabet that included vowels came into being, an event that Hawley calls “the alphabetic leap.”

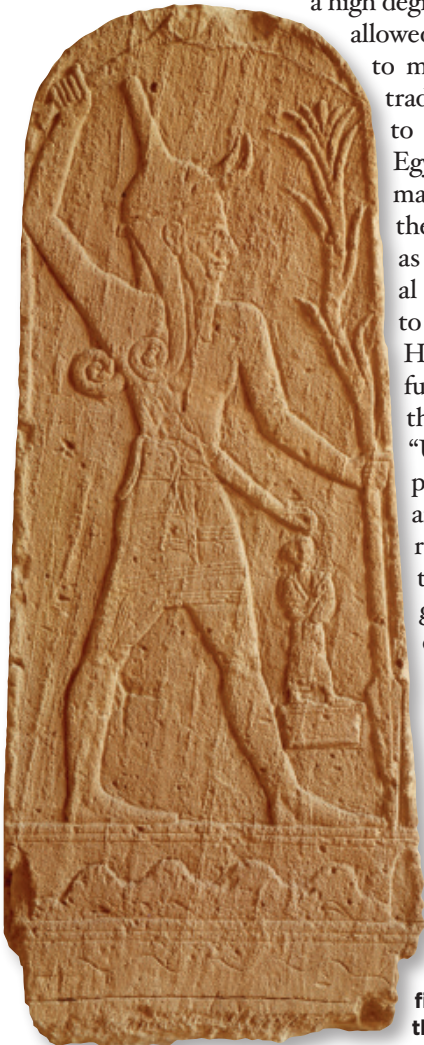
The new script proved very popular. Scribes wrote down local myths, poems, and religious texts using it, jotted administrative records, and scratched it on everyday objects including axes, jar handles, weights, and spindle whorls, sometimes to indicate ownership, says Boyes, but other times, according to Hawley, apparently because they were practicing the new script—or reveling in it. Nearly half of all the texts from Ugarit appear in the new script, every word of them written in the city’s final century. Hawley believes that even if it started as a top-down project, Ugarit’s lettered classes took to the new script enthusiastically because it spoke to their need to affirm their identity in a globalized world. “There was an emotional attachment to this alphabet,” says Hawley. “One, it was easy to learn. Two, it was theirs. We have seals that have the word ‘seal’ inscribed on them. They’re fascinated with this local alphabet. They’re excited about it. The scholars who were training themselves to write Babylonian and Sumerian—we have the tablets with school texts that they were copying—would doodle the new alphabet in the margins.” Only a small percentage of Ugarit’s residents could read and write texts, though many more could write well enough to scribble basic records.

There are other signs, too, that Ugarit’s citizens, despite, or perhaps because of, their bustling trade ties, grew even more

prickly about asserting their identity and more suspicious of foreigners in their midst during the city's last decades. Foreign merchants, especially from Anatolia, now modern Turkey, were barred from owning property in the city or, in some cases, even overwintering there. Officials kept careful records on foreign residents, and laws restricted the amount of debt that local people could owe to foreign creditors. "They wanted foreigners coming and bringing things, but they also wanted to police how much power they had," says McGeough. "Elders in the community didn't like the fact that merchants from another city owned property in the community when local people were in debt."

YET ALL DID NOT GO as hoped for the kings and merchants of Ugarit, and trouble was already looming on the horizon before the appearance of the Sea Peoples. In the fourteenth century B.C., King Niqmaddu II (r. ca. 1350–1315 B.C.) had signed a treaty establishing Ugarit as a Hittite vassal city-state. He may have been bowing to the inevitable as Hittite armies gobbled up weaker states across northern Syria. But the Hittite rulers afforded Ugarit a high degree of autonomy—they allowed the city's residents to maintain their lucrative trade ties and its rulers to continue to bring in Egyptian craftspeople and marry their children into the Egyptian royal line, as long as they sent annual tribute and soldiers to the Hittite capital of Hattusha. This had fateful consequences when the Sea Peoples invaded. "Ugarit was expected to participate in war efforts and send troops when requested by the Hittites," says archaeologist Caroline Sauvage of Loyola Marymount College, who was last

A limestone stela found on Ugarit's acropolis is believed to depict the city's patron deity, Baal, brandishing a thunderbolt or club while driving a spear or plant into the ground. The small figure may represent the king.



A gold-covered bronze statue of a deity was found in Ugarit.



able to excavate at Ugarit in 2009. "Apparently this was the case before its destruction, and it might have left the city somewhat unprotected."

In its final years, in the last decades of the thirteenth century B.C., the city's population of about 10,000 seems to have increased, possibly due to drought in the surrounding farmland putting stress on food supplies and causing people to move to denser settlements. The Hittite capital in Hattusha was under assault either from foreign invaders, internal tumult, or some combination of the two, and soon Ugarit faced its own attackers. Archaeologists have found spearpoints—evidence of hand-to-hand combat—and traces of fires that burned simultaneously all over the city. At some point, the city seems to have been completely abandoned. Unlike nearly all other cities in northern Syria, which were soon reoccupied, Ugarit shows no sign of large-scale repopulation for at least three centuries. "Writing stops, everything stops, and no one comes back," says archaeologist Eric Cline of George Washington University. "They didn't even come back to dig up their buried hoards. Maybe they were all killed. But then, we don't have any mass graves, and there's no mention of them being enslaved."

If he escaped the chaos of invasion, Urtenu does not seem to have ever returned to the ruins of his humble home. On the first floor, French archaeologists found a decorative alabaster chariot pommel, an object that signified prestige and royal favor for its owner. Urtenu never retrieved this treasured possession. The house's second floor, where Urtenu kept his tablets on neat shelves, collapsed onto the first and both remained buried beneath rubble until archaeologists arrived in 1986. The alphabetic script that scribes had scratched into clay at Urtenu's house seems to have died with Ugarit, Boyes says, although its use may have continued elsewhere for a time on materials that have decayed and are invisible in the archaeological record. A few centuries later, new alphabetic scripts, forerunners of our own alphabet, appeared in port cities on the coast of modern-day Lebanon controlled by the Phoenicians, who had been among Ugarit's main trading partners. Scholars cannot draw a straight line from Ugarit to Phoenician writing, says Boyes, but "they're siblings and very much part of the same regional network of culture and writing practices, so I'm sure they operated in an environment of mutual awareness and influence." Alphabetic writing also took hold in the Aramaic kingdoms of northern Syria and, later, the biblical cities of Canaan. Old Mesopotamian cuneiform withered away. "Something happened between the thirteenth and the ninth centuries to make alphabetic writing catch on," says Hawley, "but those intervening centuries are simply undocumented. Ugarit was a precursor and announced what was going to happen." ■

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RISE OF THE KINGS OF TONGA

By combining excavation and oral history, archaeologists are discovering how a dynasty of chiefs united a Polynesian archipelago

By BRIDGET ALEX

ON A TONGAN ISLAND 2,000 miles east of Australia, a group of chiefs scale a large sacred mound, ostensibly to spend the day catching pigeons. Each competitor crouches in place, concealed within one of the beehive-shaped huts that rim the hillcrest. Nearby, attendants fly trained birds on strings, like kites, to lure wild flocks. The chiefs wave nets on 12-foot poles through slits in the huts trying to snare lupe, or Pacific imperial pigeons. For hundreds of years, only the Tongan upper class was permitted to hunt these birds, which are endowed with puffy white chests and gleaming teal wings.

Archaeologist David Burley of Simon Fraser University has identified dozens of these pigeon-snaring mounds, many of which are still visible on Tonga's gently rolling, palm-studded islands. Burley likens the forgotten sport to golf today—a low-exertion game that offers the upper classes networking opportunities—and posits that while netting birds, chiefs negotiated their roles and rights. “Clearly, it went beyond catching pigeons,” he says. “This is where alliances were forged.” By building the monumental mounds and catching the birds, the chiefs also showcased their power to commoners. Such acts of political theater likely helped catalyze events that transformed the fabric of Tongan life beginning in the tenth century A.D.

For much of their history, Tongans lived like other Polynesians and were organized in small-scale, village-level societies. “They were run by chiefs and they encompassed a segment of an island, or perhaps an entire island,” says archaeologist Geoffrey Clark of the Australian National University. But sometime before the fourteenth century, Tonga's growing population and struggle over agricultural resources seem to have led to the rise of one especially powerful line of chiefs. Called the Tu'i Tonga, they eventually unified the Tongan archipelago of more than 160 islands into a single kingdom. The title of Tu'i Tonga passed from father to son for 39 generations, their

reign secured by stories of the family's semidivine ancestry, which made them intermediaries between gods and mortals. Clark argues that this kingdom was what archaeologists call a primary state, a form of government in which all people are ruled by paramount leaders and institutions, and which was not inspired by preexisting states.

Scholars have long believed that primary states only arose in Egypt, Mesopotamia, the Indus Valley, China, Mesoamerica, and the Andes. In these regions, smaller societies were consolidated under a central power, often headed by a king who claimed divine origin. Strict social division was enforced between commoners and elites, and a top-down bureaucracy maintained military and religious affairs. All other states, they argued, from Rome to the Aztec Empire, were formed in the wake of the independent establishment of primary states in these six areas.

All of these primary states seem to have coalesced before the development of regional literary traditions that might have left records dating to the time of their formation. Thus, archaeologists have no primary sources to help them understand these watershed events, which were arguably as consequential as the invention of agriculture. But, unlike Egyptians or Mesopotamians, Tongans have an enduring tradition of oral history that records the feats of the Tu'i Tonga and other events that may have influenced the rise of the Tongan state.

Captain James Cook, the eighteenth-century British explorer, and other Europeans also left descriptive records of their early impressions of Tonga. Like all histories, these accounts are incomplete, but Clark and other archaeologists are using them to help explain the evidence they are now uncovering on the archipelago of the early days and the tempestuous later years of the Tongan kingdom. “We're trying to take the seven- or eight-hundred-year sequence of the Tongan state and really understand why it was particularly strong at times and not at others,” says Clark. Exploring the complicated social dynamics at work during the kingdom's history offers archaeologists a

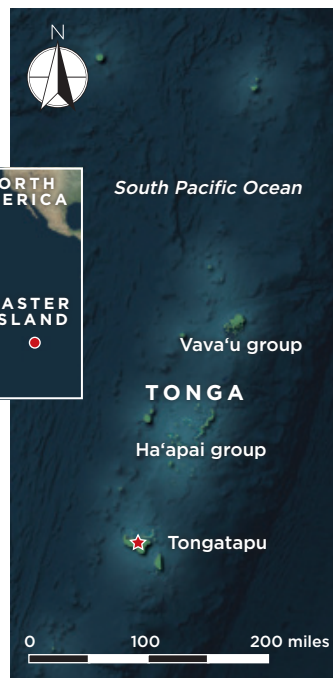
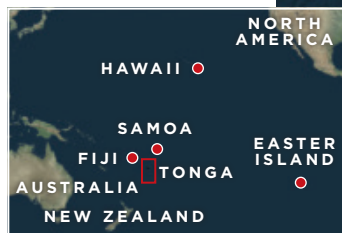
A 20-foot-tall limestone trilithon stands at Heketa, Tonga, one of the royal capitals of the Tu'i Tonga Dynasty, which ruled from around A.D. 950 to the nineteenth century.

chance to understand how this early state formed, faded, and then grew anew, potentially giving voice to the conversations that took place among the power brokers atop the pigeon-snaring mounds.

THE TONGAN ARCHIPELAGO sits in the southwest Pacific, just east of the geographic division nineteenth-century Europeans drew between Melanesia and Polynesia. Tongatapu, Tonga's largest island, is about 500 miles from its nearest neighbors, Fiji and Samoa. This three-nation cluster lies along the western edge of the Polynesian Triangle, which is anchored by Hawaii, New Zealand, and Rapa Nui or Easter Island.

The earliest signs of human presence anywhere in Polynesia come from Tongatapu. There, on the edge of a lagoon, Burley discovered Tonga's first known village, where people built homes that rose above the sea on stilts around 900 B.C. His excavations revealed tens of thousands of pottery sherds, some decorated with mazes of dotted lines. These motifs are distinctive symbols made by people who belonged to the Lapita culture, whose pottery has been found from New Guinea to Samoa and who are credited with being the South Pacific's founding settlers.

Dates obtained from coral artifacts and charcoal unearthed at the lagoon site are the oldest in Polynesia. Dates from other sites on the Tongan archipelago show that within three generations, the founders had established hamlets on two parallel strings of islands—one coral limestone, the other volcanic rock—that extend a few hundred miles north of Tongatapu. The settlements of these ancestral Tongans defined the geographic contours of the future kingdom, which extends across an ocean expanse roughly the size of Texas.



No evidence exists that any one chief outranked the others during this period. Like other people in Polynesia, Tongans seem to have been ruled by numerous chiefs at any given time for some 1,000 years. Then, say the oral histories, around A.D. 950, one chief, 'Aho'eitu, rose above the rest. He began the Tu'i Tonga Dynasty, which eventually brought the other chiefs under its control and remained in power until the nineteenth century. According to Tongan oral history, 'Aho'eitu was the love child of an earthly woman and a heavenly god, giving him and his descendants the divine right to rule.

An amalgam of history and mythology, the Tu'i Tonga origin story likely streamlines what was surely a contested and sometimes bloody ascension. Archaeological evidence for warfare during the rise of the Tu'i Tonga is elusive, however, and little is certain about the dynasty's early days. While 'Aho'eitu's legacy and exploits are celebrated in Tongan oral history, only fragments of stories about his immediate successors have been carried down through the centuries. Even the Tu'i Tonga's royal estate was abandoned and forgotten, though the ruins were rumored to be somewhere in Tongatapu's southeast interior. In the 1960s and 1980s, archaeologists searching the area noted dozens of mounds surrounding a boys' boarding school. But they found no direct evidence of the lost capital such as the quarried stone blocks that distinguish later Tu'i Tonga monuments.

Between 2013 and 2018, archaeologist Travis Freeland, now project manager at the archaeological company Kleanza Consulting, conducted a lidar survey of Tongatapu that included the boarding school site. In all, Freeland identified some 10,000 mounds that might contain the remnants of tombs, homes, and fortifications across the island. "It looks like the surface of the moon, but instead of craters, there are mounds," Freeland says. He also found subtle yet unmistakably human-made features at the boarding school site that archaeologists had missed on the ground. He discerned ancient paths, trenches, at least 17 round mounds, and seven squat, rectangular platforms, now barely perceptible under stands of trees, and in pastures and coconut plantations. The largest platform rises only eight feet, but spans the area of a football field and holds enough packed



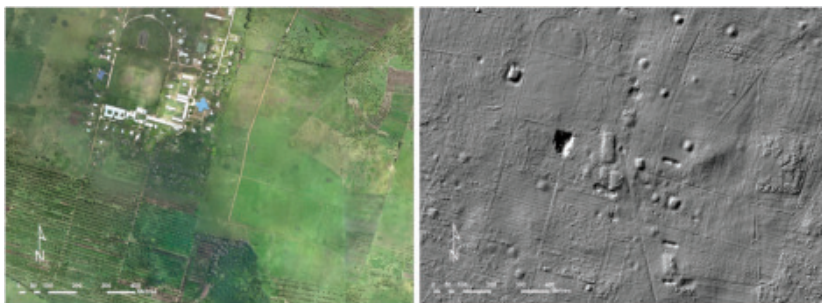
An eighteenth-century French engraving depicts a feast held by the king of Tonga on the island of Tongatapu. At the image's far left is a pigeon-snaring mound topped by a ring of huts.

dirt to fill four Olympic swimming pools. The 350-acre site's large monuments, which seem to have been laid out according to a careful plan, have convinced Freeland that it is the lost Tu'i Tonga capital, where the first nine members of the lineage are said to have lived and reigned. The rectangular platforms may have been stages for events known from later times, including the chiefly sport of reed dart throwing, or ceremonies to award lesser chiefs inheritable titles, one way to appease potential rivals.

If Freeland is correct, by about A.D. 1000 the Tu'i Tonga wielded enough clout to command the construction of a stadium-size packed-earth platform. "We're talking about something that would have taken teams of probably hundreds, or at least dozens, of people," says Freeland. "This is clear evidence of coerced labor of some type." The site's inland location on agricultural land may help explain how the Tu'i Tonga first gained leverage over their fellow Tongans. "Something that's really significant about this first capital site is that it's right in the middle of the island," Freeland explains. Evidence suggests that at this time the Tongan population was growing and becoming more reliant on agriculture, especially root crops such as yam and taro. Those with farms had control of food supplies—and a pathway to power. The Tu'i Tonga were likely still jockeying for control over Tonga with other high chiefs, and their control over fertile fields in the island's interior would have strengthened their position.

This scenario complements data collected from coastal sites, which suggests that Tongans were depleting marine resources, including lagoon fish and shellfish, as their population grew. A recent isotope analysis of 125 skeletons spanning 2,600 years of Tongan history shows that individuals who lived after the Tu'i Tonga's rise began appear to have eaten less seafood and relied more on crops and domesticated animals, including chickens and pigs. Also, around this time, people from the Tongan and Samoan islands of the western Pacific began to explore eastern Polynesia, reaching Hawaii and Rapa Nui between A.D. 1000 and 1250. Some archaeologists believe that this migration was driven at least in part by competition and resource scarcity in Tonga, which may have pushed many islanders seaward to find new homes. On the islands of Tonga itself, competition for resources could have pushed chiefs to intensify their efforts to build monuments and host festivals and sporting events. Though the Tu'i Tonga may not yet have ruled over the entire Tongan archipelago, they were beginning to amass unprecedented power.

To chart the Tu'i Tonga's political fortunes, Clark has documented their increasingly ambitious building projects. Measuring the scale of these monuments is



Aerial (top left) and lidar (top right) images show mounds on the grounds of a school where archaeologists believe the original Tu'i Tonga capital once stood. One such mound (above) is one of 10,000 identified on the island of Tongatapu.

an effective way to gauge the dynasty's power because, he says, according to traditional oral history, the buildings were completed with corvée labor, unpaid work commoners owed a central authority like taxes. Judging by the complexity of monuments, the Tu'i Tonga family had come to outrank other high chiefs by the end of the thirteenth century, when Momo, the tenth Tu'i Tonga, moved his capital to a spot on Tongatapu's northeast coast called Heketa. There, the royals erected Tonga's first megalithic monuments, including platforms faced with limestone slabs and a stone trilithon, a monument with two vertical structures supporting a third, standing nearly 20 feet high and estimated to weigh at least 55 tons. To build this megalith, laborers cut reef limestone by hand from an outcrop on the shore about a quarter mile away. For other building material, they traveled by canoe to small offshore islands, where low tide exposed carbonate rock that they quarried for building slabs. "It was really quite a horrible job," says Clark, who has been re-creating the process in experiments.



A fragment of pottery made by the Lapita people found at the earliest settlement on Tongatapu dates to about 900 B.C.

“Making workers go to all the trouble to make stone mounds was obviously reserved for the higher-up people.” Clark also believes that Heketa hosted the original *‘inasi*, or first fruits ceremony, where commoners and chiefs feasted, danced, and paid tribute of yams and other produce to the Tu‘i Tonga to ensure successful harvests.

Around 1300, the twelfth Tu‘i Tonga, Talatama, marshaled the resources to construct the dynasty’s third and final capital at Lapaha on the edge of the same lagoon where Tonga’s oldest known village had been built more than 2,000 years earlier. The Tongan builders extended the land into the lagoon by depositing layers of coral rubble, soil, and limestone atop the tidal zone—an engineering feat remembered in traditional history and confirmed by excavations. The new precinct featured administrative buildings, royal residences, and a harbor for docking canoes. It also served as the royal burial ground, where 34 stone tombs were added over several centuries. Made from nearly 700 tons of cut stone, the largest tomb, known as Pae-paeotela, is also the oldest, suggesting that the Tu‘i Tonga were at their zenith when they founded this capital. Clark believes that at this point, the Tu‘i Tonga sat at the apex of a rigid social hierarchy that scholars would later define as a primary state.

Over the past 15 years, Clark has worked with the local com-



A nineteenth-century French print (top) depicts royal houses and a megalithic tomb at the Tongan capital of Lapaha. Oral histories record that this tiered royal tomb (above) was built for the twenty-ninth Tu‘i Tonga’s daughter.

munity to preserve the Lapaha tombs. “It’s very important to us here in our village, in our heritage,” says Malia Melekiola, a resident of the modern village of Lapaha. Her father, the late Kelekolio Nivaleti Melekiola, was a local official who worked with Clark for more than a decade. He led community projects that used traditional tools and construction methods to restore some of the monuments. Since her father’s death in 2017, Malia Melekiola has coordinated local efforts to safeguard the ancient capital. She explains that everyone in Lapaha knows the tombs’ history, which is passed from generation to generation. “It’s a sacred place,” she says.

BEYOND THE CAPITAL at Lapaha, chiefs of lower rank also used forced labor to raise hundreds of other monuments that acted as conspicuous reminders of the ruler-commoner divide. These include what Tongans call *‘esi*, or platforms, where chiefs rested and enjoyed commanding views. There were also freshwater bathing wells and the pigeon-snaring mounds. Burley has been mapping these features since the 1990s and using lidar has accelerated his search. The pigeon-snaring mounds are especially easy to identify on lidar maps. “They look like little doughnuts,” says Burley. Using this technology, Freeland has counted 42 such mounds on Tongatapu alone, adding to the two dozen Burley and others had previously found across the archipelago while surveying on



A slab of limestone remains cut but unmoved in the tidal zone of an island in the Ha‘apai group. Reef rock was hand quarried for Tongan royal monuments.

foot. On Tongatapu, one area near Lapaha had at least seven pigeon-snaring mounds connected by walkways and flanked by canoe docks that received visitors from other islands.

Archaeologists have also mapped mounds and other monuments on Tongan islands to the north, which are part of the Ha'apai and Vava'u groups. Traditional stories about the monuments and archaeological evidence both indicate that they were likely built in the fifteenth century by lower-ranking chiefs. To maintain their power across the archipelago, the Tu'i Tonga posted these chiefs as their representatives on far-flung islands. This helped placate potential rivals, as the appointees could oversee commoners, land use, and construction projects, as if ruling their own mini kingdoms.

The Tu'i Tonga's rule did not go unchallenged. Oral histories tell of considerable social upheaval starting around 1500, including a series of royal assassinations. Tradition holds that around this time the twenty-third Tu'i Tonga was killed because he demanded too much labor and resources for royal tomb building. Other Tu'i Tonga are said to have been assassinated during this era. Eventually, two splinter lineages, the Tu'i Ha'atakalaua, followed by the Tu'i Kanokupolu, assumed the maintenance of secular affairs, though the Tu'i Tonga retained the spiritual and symbolic throne. "Elite power and influence got too large," says Clark, "and then there was some kind of reformulation."

Tonga's archaeological landscape reflects this changing order. Soon after they took charge of day-to-day affairs, the Tu'i Ha'atakalaua and Tu'i Kanokupolu began burying their dead in stone tombs. Though their burials were modest in comparison to the Tu'i Tonga megalithic graves, building with quarried rock had once been solely the Tu'i Tonga's prerogative. The two new lineages also built compounds abutting the original dynasty's precinct at Lapaha. Other indications that at least some Tongans contested the political order are less conspicuous, and are only now being revealed by lidar. Australian National University archaeologist Phillip Parton recently identified earthwork defenses at Lapaha facing west, where those who assassinated the Tu'i Tonga are said to have come from. Parton has also spotted dozens more defensive earthworks across Tongatapu. Though many probably date to a nineteenth-century civil war, some appear to be much older. If they are, Parton wonders if they may tell the story of conflicts and rocky successions forgotten in oral histories. "Perhaps some of these lineage changes were contested," he says. Despite these periods of unrest and direct challenges to their royal status, the Tu'i Tonga still acted as divine kings when Dutch explorer Abel Tasman first reached Tongatapu in 1643.

AS EUROPEANS' PRESENCE in Polynesia increased through the 1700s and 1800s, virtually all Polynesian peoples were colonized by foreign empires. Although Tonga remained independent, Europeans introduced guns, measles, and clashing forms of Christianity to the archipelago. These destabilizing forces stoked preexisting tensions among ruling families that erupted in a brutal civil war in 1799. During this



Lapaha community members use traditional tools and methods to restore a royal tomb at the former capital.

era, violence, famine, and disease reduced Tonga's population by an estimated 30 to 50 percent.

The war lasted more than 50 years, and finally ended in the victory of the Tu'i Kanokupolu lineage, which established a Christian monarchy in 1875, 10 years after the death of the thirty-ninth and last ruler of the Tu'i Tonga Dynasty. In 1900, Tonga was made a British protectorate, but the Tu'i Kanokupolu remained on the throne. In 1970, Tongans regained their sovereignty and today are citizens of an independent constitutional monarchy.

Modern Tongans are the descendants of the early stone-workers who cut reef rock for tombs, the commoners who paid tribute at first fruits ceremonies, and the chiefs who snared pigeons and threw darts. Their history is relevant beyond the archipelago. "Tonga is a microcosm," says Burley. "It's been a dynastic political entity for the longest time." Its longevity and relatively late emergence means Tonga could provide answers to long-standing questions about state formation around the globe. Already, research shows that monuments, festivals, and elite privileges like pigeon hunting helped solidify the social divisions crucial to the ascent of the Tu'i Tonga Dynasty. Threats, violence, and resulting compromise also figured into how the Tu'i Tonga maintained their rule. Though Tonga's trajectory was unique, it has become what may be the best documented case of a primary state—supported by traditional knowledge, written testimonies, and a burgeoning archaeological record. ■

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AUTOBIOGRAPHY OF A MAYA AMBASSADOR

**A grand monument and a humble
burial chronicle the changing
fortunes of a career diplomat**

by ERIC A. POWELL



A Maya vase painting depicts a procession of men identified by hieroglyphs as *lakam*, an obscure official title that is translated as “bannerman.”

ON THE NIGHT OF June 24, A.D. 726, a Maya official named Ajpach' Waal reached the pinnacle of his career. On that day, he was granted an audience with the thirteenth king of Copán, known to scholars today as 18 Rabbit, but to his subjects as Waxaklajuun Ub'aah K'awiil. Situated in a mountain valley in what is today western Honduras, Copán was one of the great Maya city-states. Even now its central plaza is covered with stelas, some standing more than 30 feet tall, which are carved with hieroglyphs that record the deeds of Copán's kings. A six-story staircase leading to a ritual platform at the city's center is composed of blocks carved in the shape

of hieroglyphs that describe the city's history. 18 Rabbit was responsible for building the staircase's lower half, which he dedicated in his father's honor.

It is possible the king received Ajpach' Waal atop this staircase, just as he might have received his royal courtiers or other subjects. But Ajpach' Waal was different from the officials and most of the other people 18 Rabbit encountered on a daily basis. He wasn't from anywhere close to Copán, which lay on the far eastern edge of the Maya world. Ajpach' Waal's home was the city of El Palmar, a 200-mile journey to Copán over rugged terrain. Why he had made such a long and arduous trip, which probably took at least a month on foot, isn't entirely clear. But given the dangers involved in this trek, which took





him across mountains and through the territory of other Maya city-states, it is likely he was on an important mission.

What happened when Ajpach' Waal spoke with 18 Rabbit was not recorded, but the journey and the meeting were momentous enough to have been memorialized on a monument unlike any other yet found from the ancient Maya world. On September 14, just shy of three months after his audience with Copán's king, Ajpach' Waal dedicated his own nine-foot-tall hieroglyphic staircase, which was attached to a temple at El Palmar. First discovered by University of California, Riverside, archaeologist Kenichiro Tsukamoto and his team in 2009, the staircase is composed of blocks carved with hieroglyphs that celebrate Ajpach' Waal's lineage, his journey to Copán, and his relationship to the king of El Palmar as well as to the ruler of the mighty city of Calakmul, some 30 miles to the west. It also references Ajpach' Waal's official title of *lakam*, or "bannerman," an obscure term that Mayanists have speculated about since it was deciphered three decades ago. "We've never seen something monumental built to celebrate a lakam," says Tsukamoto. "We weren't even certain what role lakam played in the Maya world."

The discoveries of this staircase and the nearby burial of a man in his 50s who in all likelihood is Ajpach' Waal himself are giving archaeologists a chance to write the biography of a lakam who lived during a time dominated by extraordinary political events in which he may have participated directly. While exploring Ajpach' Waal's life history, Tsukamoto and his colleagues have found that the tale told by his elaborate hieroglyphic staircase and the reality laid bare by what are likely his skeletal remains are, in fact, quite different and speak to the tumultuous times in which this lakam lived and died.

AFTER THEIR REDISCOVERY in the nineteenth century, Maya hieroglyphs long resisted decipherment. Only in the 1980s were epigraphers able to begin accurately reading large numbers of Maya hieroglyphs, many of which record historical events. This breakthrough allowed Mayanists to partially reconstruct the political history of the Classic Maya city-states that thrived from around A.D. 250 to 900. A picture emerged of dozens of separate, often competing, kingdoms that formed constantly shifting alliances. The kings

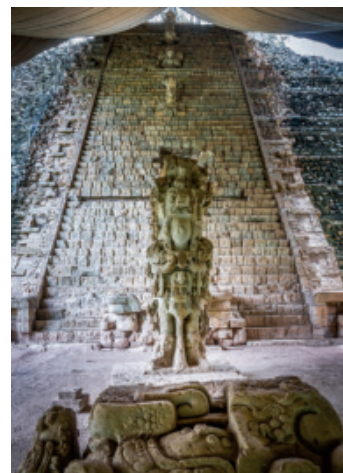
of the two largest cities, Calakmul and Tikal, clashed in a series of wars. These two superstates drew much of the rest of the Maya world into their long-running dispute.

The decipherment of any unknown glyph can change the trajectory of scholars' efforts to understand this complicated history. Around 1990, University of Texas at Austin epigrapher David Stuart deciphered a Maya hieroglyph that phonetically spelled the word "lakam," which in modern



A monumental staircase (right) composed of stone blocks carved with hieroglyphs still stands at the Maya city of Copán in Honduras.

Yucatec Maya means banner or flag. He found the hieroglyph paired with the word for stone, and, when placed together, the hieroglyphs stood for the word meaning stela. "The Maya understanding of a stela is a stone flag," says Stuart. "So we had the word 'lakam'



and understood it as an upright monument.” With the glyph for lakam translated, Stuart and other Mayanists began to notice that “lakam” was used in another, albeit very rare, context. A handful of ceramic vessels were painted with the lakam glyph next to depictions of men sometimes sitting near kings in courtly settings. The late epigrapher



“We weren’t expecting to find anything particularly special there,” says Tsukamoto. “We wanted to see what life was like away from the city’s royal center.” Soon, however, the team discovered the hieroglyphic stairway, buried by just a few inches of soil, leading to a temple. The staircase was made up of 164 hieroglyphic limestone blocks, each measuring about a foot tall, organized in six steps that stretched more than 30 feet wide. “It was intact and a real surprise,” says Tsukamoto. “You don’t expect to find a monument of this quality decorated with

A nine-foot tall staircase (left) at the site of El Palmar was dedicated by the *lakam* Ajpach’ Waal on September 14, A.D. 726. One of the stone glyphs (above and highlighted, left) that make up the staircase references the king of the nearby city of Calakmul.



Alfonso Lacadena of the Complutense University of Madrid proposed that lakam occupied an as-yet-unknown category of official or noble. They may have been men whose social standing lay somewhere between the nobles of the royal court and the mass of Maya commoners. Some of these lakam were depicted speaking with the king, often with bags of goods nearby. One example showed the lakam as part of a war party. Perhaps, proposed Lacadena, lakam were the king’s flag bearers, officials responsible for collecting tribute or for administering military affairs. But depictions of lakam are so rare that it was difficult to know what they really did or how significant a role they played in Maya society.

That changed when Tsukamoto first surveyed a cluster of buildings called the Guzmán Group oriented around a small plaza about a mile away from the core of El Palmar.

so many hieroglyphs in such a modest neighborhood.”

Tsukamoto and a colleague, epigrapher Octavio Q. Esparza Olguín of the National Autonomous University of Mexico, began to decipher the hieroglyphs, working separately so as not to influence each other’s interpretation. They expected the inscription to celebrate the deeds of the king of El Palmar. And, indeed, the staircase referenced the monarch, but it also prominently featured the lord of the mighty city of Calakmul, whose kings were known as the Kaan, or Snake, Dynasty. Even more puzzlingly, the inscription didn’t focus on either king, but on a lakam. Glyph by glyph, Tsukamoto and Esparza Olguín discovered that the staircase celebrates the lineage of Ajpach’ Waal, who is identified as the most recent of five generations of lakam to serve the king of El Palmar. The central event of the narrative is Ajpach’ Waal’s journey to Copán, apparently under the auspices of the king of Calakmul. The glyphs suggest that the kings of both El Palmar and Calakmul attended the monument’s dedication. The staircase itself faced not toward the center of El Palmar, but to the west, in the direction of Calakmul, which could allude to Ajpach’ Waal’s open allegiance to the Snake Kings. If Ajpach’ Waal made his journey to Copán at the king of Calakmul’s behest, perhaps, thinks Tsukamoto, he was there to broker some kind of alliance between Calakmul and Copán against Tikal, the Snake Kings’ mortal enemy.

If so, the diplomatic mission must have been a success, or must at least have been resolved in such a way that Ajpach’ Waal commemorated the journey in an unprecedented way—by commissioning a hieroglyphic staircase celebrating the achievements of a nonroyal official. Initially, other Mayanists questioned Tsukamoto and Esparza Olguín’s interpretation. “I thought it was far-fetched that Copán would be mentioned on a monument like this. It’s just so specific, and so far away from Copán,” says Stuart. “But when I saw it for myself, there was just no question that they got it right.”

Stuart also notes that the fact that the staircase tells the story of an epic trip raises intriguing questions about the monument itself. The Maya verb used to denote making such



A scene on a Maya vase depicts a seated king (at right). Hieroglyphs suggest the men he is speaking with might be *lakam*.

a journey translates into English as “to go up.” “It’s like we might say, ‘I’m going up to Boston,’” says Stuart. To represent this verb, the Maya used a glyph of a staircase. “The main event this staircase celebrates is a journey that’s written as a staircase,” says Stuart. “I wonder if this physical staircase was emblematic of the journey itself. He would also have had to go up a lot of mountains to get to Copán, and the staircase could represent that as well. The Maya often sent many layered messages with their monuments.”

The knowledge that Ajpach’ Waal undertook some kind of diplomatic mission in the service of the king of Calakmul is bringing the roles *lakam* played in ancient Maya society into sharper focus. “We had questions about the *lakam*, and it remains a fairly rare title,” says Stuart. “But the thing with these glyphs is, it couldn’t be clearer what he was doing.” As a diplomatic official, perhaps Ajpach’ Waal was a metaphorical banner

for the king, or perhaps he even carried a banner or standard of some sort as he traveled and engaged in diplomatic rituals at foreign capitals. Portions of the inscription even suggest Ajpach’ Waal’s mother was of royal descent. This *lakam*, it seemed, was an important man who played a critical role not just in El Palmar, but in courts far beyond the borders of his city.

ONCE TSUKAMOTO AND ESPARZA OLGUÍN identified Ajpach’ Waal as a key diplomat, Tsukamoto became eager to excavate the platform behind the staircase, which he thought might hold the remains of the official himself. “Based on the splendor of the staircase, we expected to find a spectacular burial or a tomb with rich offerings,” says Tsukamoto. Instead, his team found only a modest stone chamber containing two ceramic vessels and the remains of a man. This is presumably Ajpach’ Waal, although radiocarbon dating of charcoal found around the bones suggest that they could possibly belong to his father. One vessel is decorated with a painting of a priest performing a fire ritual, framed by hieroglyphs. The glyphs are gibberish symbols painted by an artist who was probably illiterate, likely not one of those who carved the staircase’s splendid blocks. Ajpach’ Waal’s bones, however, speak volumes.

University of Oklahoma bioarchaeologist Jessica I. Cerezo-Román analyzed the remains and found that Ajpach’ Waal led a long and sometimes grueling life. “The bones can tell us so much,” she says. “They reflect the life of someone who grew up in perhaps politically unstable conditions.” Cerezo-Román discovered that Ajpach’ Waal’s bones show signs of malnutrition and possibly scurvy. Evidence of trauma in his shinbones is consistent with injuries suffered by people who play contact sports today, suggesting he may have been frequently injured playing the Maya ball game. “Two of the glyphs in the staircase depict ballplayers,” says Cerezo-Román, “and these injuries seem to confirm he participated in the game.”

Cerezo-Román also found that Ajpach’ Waal suffered from severe arthritis in both his arms and legs. “This is the kind of arthritis we see today in old people,” says Cerezo-Román.



A painting on a ceramic vessel discovered in a burial near Ajpach’ Waal’s monumental staircase depicts a fire ceremony. The glyphs on the vessel are purely decorative and have no meaning.

Teeth from a burial near the El Palmar staircase show that the deceased man had jade and pyrite inlays in his teeth. One tooth (near right) is missing the inlay.

“It also suggests that he was engaged in strenuous activity, perhaps from walking many miles over rough terrain. He likely walked up and down large monuments regularly, and may have often crouched in subservient positions in front of higher-status individuals.” The arthritis in his elbows could even have been caused by long periods of holding a banner aloft.

Most telling, though, is the state of Ajpach’ Waal’s teeth. Like other ancient Maya of high status, his teeth were decorated with jade and pyrite inlays inserted during multiple painful and likely expensive procedures. One inlay in a prominent front tooth is missing. “At first I was afraid I misplaced it during our excavation,” says Tsukamoto. “But Jessica told me it had fallen out while he was still alive.” Dental calculus formed over the hole in the tooth where the inlay was once placed. “That’s enough to suggest that the inlay fell out well before he died,” says Cerezo-Román. Evidently, Ajpach’ Waal was not



that time, Calakmul itself fell to Tikal.

What El Palmar’s role was during these turbulent events is unclear, but Ajpach’ Waal himself probably lived to see the achievements celebrated on his staircase rendered obsolete. Perhaps his ties to the former king of Calakmul even became a liability and his status fell precipitously, leaving him unable to pay for a replacement inlay or a burial commensurate with his past accomplishments.

AJPACH’ WAAL’S ONCE-BRILLIANT career illuminates the role that his fellow lakam played in the courts of the Maya world. “This was an utterly unexpected find, and it gives us a chance to reframe how we understand the lakam,” says Stuart. “It’s possible they were the glue that held these city-states together by negotiating these complex political relationships.”

Other remains from burials in the Guzmán Group have yet to be studied, but Cerezo-Román believes they likely belong to Ajpach’ Waal’s family. The Guzmán Group was probably his ancestral home, and his family may have continued to



These two glyphs together represent the name of the *lakam* Ajpach’ Waal.

able to afford to replace the inlay, which would have been a serious blow to a lakam. “It would have been very embarrassing,” says Tsukamoto. “Like a politician or an actor missing a front tooth today, it would have been hard for him to get people to take him seriously while he was speaking in public.”

Together with his modest burial—not at all what one would expect to find in a tomb associated with such a fine hieroglyphic staircase—Ajpach’ Waal’s remains suggest his career may have taken a downward turn after his diplomatic coup of the summer of A.D. 726. Tsukamoto notes that just a decade after his mission to Copán, any agreement he might have brokered would have been in tatters. On May 3, A.D. 738, 18 Rabbit was captured and beheaded by rebels from the nearby city of Quiriguá. A stela erected in Quiriguá suggests the rebellion was supported by Ajpach’ Waal’s erstwhile patron, the king of Calakmul. Around

live there after his death. What happened to his descendants after he died, and whether they retained the title of lakam, is uncertain, but Cerezo-Román points out that while Ajpach’ Waal’s presumed burial was modest, it’s evident he was laid to rest with care. Charcoal discovered just above the tomb suggests a ritual fire ceremony was held there after the burial was complete. “This was done by people who probably loved him,” says Cerezo-Román. Tsukamoto notes that the staircase was maintained in good condition for many years after his death, suggesting that Ajpach’ Waal’s family may have treasured it as a reminder of his odyssey to distant Copán. Both his epic journey and Ajpach’ Waal’s remarkable monument were likely a source of stories that long outlived him. ■

Eric A. Powell is deputy editor at *ARCHAEOLOGY*.



A fresco in a small garden at the back of Pompeii's House of the Ceii depicts a hunting scene: before restoration and conservation (left) and (right) after recent work was completed.

POMPEII'S URBAN OASIS

Newly restored frescoes reveal an unexpected garden refuge

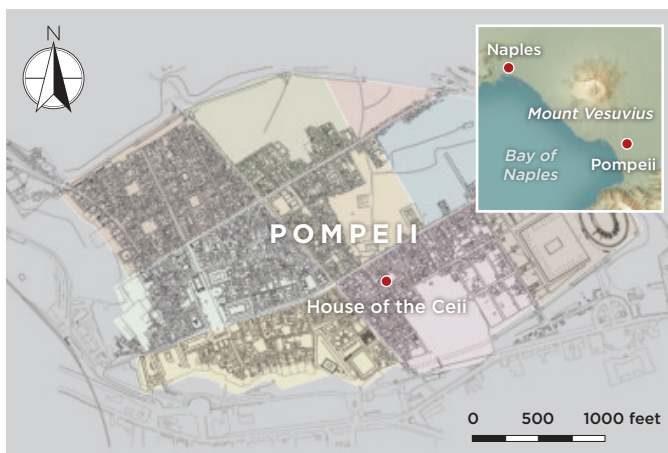
By JASON URBANUS

ANCIENT POMPEII WAS A bustling city of at least 10,000 residents. Its busy streets were lined with houses, workshops, taverns, and other commercial establishments. Traffic created by pedestrians and carts occasionally clogged its thoroughfares, and there undoubtedly would have been a cacophony of sounds and smells, many of them unpleasant. Like city dwellers today, Pompeians must sometimes have required a respite from the chaos and heat.

One homeowner perhaps out for an afternoon stroll had only to walk a block south from Pompeii's most boisterous street, the Via dell'Abbondanza, step through the doorway of his house, and wind his way through a series of rooms until he reached his own personal paradise, an elegantly decorated space as far away from the street as possible. Today, after more than a century of decay since it was first excavated, this cherished refuge has been restored and appears much closer to the way it did on the day in A.D. 79 when the eruption of Mount Vesuvius buried the city.



The House of the Ceii takes its name from the Pompeian magistrate Lucius Ceius Secundus, who archaeologists believe may have been its owner based on graffiti endorsing his political campaigns painted on its facade. Dating to the second century B.C., this house was one of Pompeii's oldest, but its owner undertook ambitious renovations, including commissioning new frescoes, after an earthquake severely damaged the city in A.D. 62. The highlights of this interior design project were the paintings covering three walls of the *viridarium*, a small pleasure garden nestled into a corner at the back of the house. These floor-to-ceiling images depict bucolic, sacred, and exotic landscapes and make the small space appear larger, much as mirrors might be designed to do in a room today. At the center of one wall, a *paradeisos*, a painting of wild animal hunt scenes, spreads across a



background of craggy rocks and trees: Two dogs pounce on a wild boar, another boar charges a pair of fleeing deer, a leopard chases two rams, and a lion pursues a bull.

On the other two walls, paintings feature scenes of activities along the Nile. Some portray boats floating on the river, while others show small temples, palm groves, or travelers peacefully sitting along its banks. In one, a group of African Pygmies fights with hippopotamuses as crocodiles look on. After Rome annexed Egypt in 30 B.C., Romans, and particularly Pompeians, became increasingly fascinated with the land and began to incorporate Egyptian imagery into their interior decor. In the years just before the city's destruction, it became popular for Pompeians to worship the Egyptian goddess Isis, and the house's Egyptian-themed frescoes suggest that its owners may have had close ties to the goddess' temple, just two blocks from home.



Top row: The central painting features various animals, including a bull, a leopard, wild boars and dogs, and a lion. Bottom row: Other scenes depict African Pygmies hunting hippopotamuses, gardens with birds and shrubs, and travelers sitting on the banks of the Nile.



Some wealthy Pompeians were able to capture the tranquil atmosphere of a rural Roman villa by attaching gardens, small orchards, fountains, and elaborate watercourses to their enormous properties. However, the House of the Ceii was moderately sized—around 3,200 square feet—and its owners had to settle for painted facsimiles that transported viewers to more idyllic landscapes. In addition to the hunting and Nilotic scenes, the walls were decorated with images of flying birds, trompe l'oeil fountains, water basins, statues, garlands, and plants. A

small water conduit running along the room's perimeter captured and channeled rainwater, perhaps to create the feeling of a country brook—during the original excavations of the house, archaeologists recovered the remains of one of the garden's last residents, a small tortoise who perished in the eruption.

WHEN THE HOUSE OF THE CEII was unearthed more than a century ago, its frescoes appeared as vibrant as they had two millennia ago. But exposure to sunlight,



rain, and humidity since then had caused them to deteriorate to such a degree that they were at risk of being lost. Some inadequate restoration practices undertaken in the past did more harm than good. Now, as part of a project recently completed by the Archaeological Park of Pompeii, the frescoes have been returned to their ancient splendor and protected for the future. Technicians used lasers to remove built-up layers of harmful deposits, conservators reattached fragile painted plaster that was peeling off in some sections, and restorers retouched paint where it was

needed. Gradually, details that had been obscured or had faded began to reemerge: rows of green shrubs, the leopard's spots, a boar's tusks, the lion's claws. The paintings' vivid reds, blues, greens, and yellows shine anew. And, once again, shelter seekers who happen to wander into the House of the Ceii and find their way into the small garden at the back can briefly escape the heat and the crowds that still throng Pompeii's streets. ■

Jason Urbanus is a contributing editor at *ARCHAEOLOGY*.

REDISCOVERING ARCHAIC AMERICA

The surprising history of eastern North America's early hunter-gatherers

By MIKE TONER

ON THE ARCHAEOLOGICAL time line of North America, the so-called Archaic period has been little more than a prehistoric placeholder, an 8,000-year hiatus between the initial peopling of the continent and the development of agriculture and settled life—a time when scholars believed nothing very important happened. For earlier generations of researchers, the people of the Archaic period, who lived between about 9000 and 1000 B.C., languished in what University of Florida archaeologist Kenneth Sassaman calls “the purgatory of America’s developmental trajectory.” They were thought to have been scattered bands of hunter-gatherers who roamed the continent and whose way of life changed slowly, if at all.

In hindsight, the only thing archaic about the period may have been twentieth-century archaeologists’ view of it. The problem, Sassaman says, is that “if you presume in advance what you aren’t going to find, you may never find what’s really there.” That’s especially true if you don’t look. One survey of scientific literature found that just 16 percent of all archaeological investigations in eastern North America over the last 40 years focused on this vast time span, which accounts for two-thirds of the time humans have occupied the continent. But those investigations that archaeologists have carried out have begun to reveal that the Archaic period in North America was, in fact, anything but uneventful.

By 8,000 years ago, some Archaic groups had developed textiles. Burials dating to this time preserved in a peat bog near Cape Canaveral, Florida, contain intricately woven fabrics used for clothing, bags, and matting. Around the same time, Archaic people in the Great Lakes region were using copper to make tools. Initially their supply of the malleable metal came from surface deposits and nuggets, but later they mined it from pits and quarries.

By 5,000 years ago, people were building massive earthen and shell mounds that required years to construct. A complex of 11 mounds at Watson Brake in northeast Louisiana may be



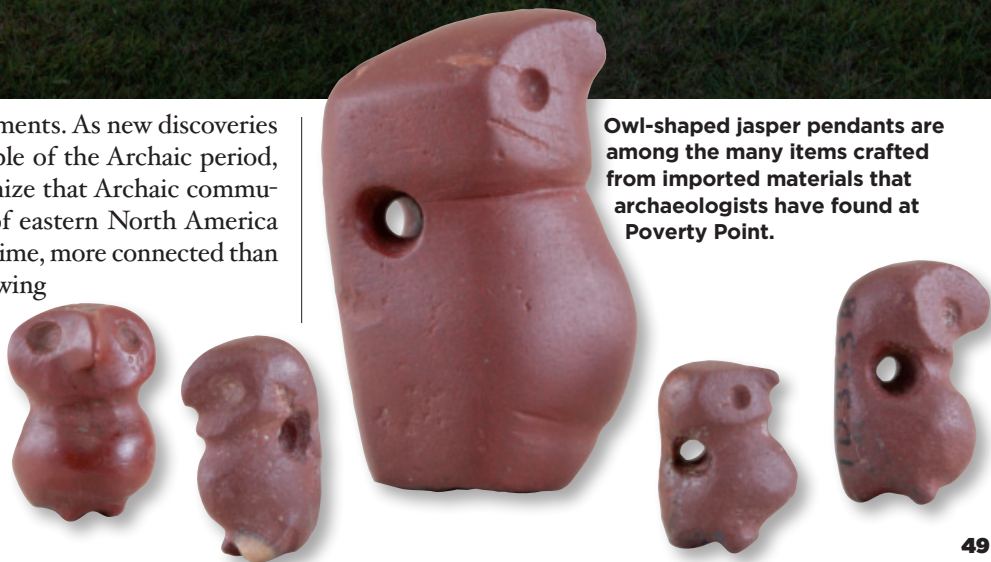
Mound A at the site of Poverty Point in Louisiana was built by hunter-gatherers some 3,200 years ago, at the end of the Archaic period, which lasted from 9000 to 1000 B.C.

the first such group of monuments in North America intentionally aligned to astronomical events, in this case the summer solstice sunset and the winter solstice sunrise. By 4,800 years ago, people were experimenting with agriculture. At numerous locations throughout the Mississippi and Ohio River Valleys they raised squash and sunflowers. They processed and stored food and may have set controlled fires to increase soil fertility and boost yields of nuts and berries in the forest. And by 4,500 years ago, people had developed ceramics. Along the Savannah River between Georgia and South Carolina and the Saint Johns River in Florida, they began to make two distinctive styles of pottery, called Stallings and Orange.



These were not isolated achievements. As new discoveries have revealed more about the people of the Archaic period, archaeologists have come to recognize that Archaic communities throughout the woodlands of eastern North America were more diverse and, at the same time, more connected than anyone had suspected. There is growing evidence that distinct ethnic groups had their own identities, culture, and rituals. And even with only footpaths and waterways to connect them, they knew a great deal about what was going on up the river, over

Owl-shaped jasper pendants are among the many items crafted from imported materials that archaeologists have found at Poverty Point.



the mountains and, in some cases, half a continent away. “Archaic societies had wide social networks that spanned much of North America,” says Matthew Sanger, curator of North American archaeology at the Smithsonian Institution’s National Museum of the American Indian.

As scholars have struggled to find a paradigm that makes sense of the relationships among people living at so many interrelated sites across eastern North America, no site has challenged their thinking more than Poverty Point. This massive complex of earthworks sprawling across 345 acres in northeast Louisiana was built just as the Archaic period was coming to a close. The immensity of its monuments, the geometric precision of their layout, and the astonishing variety of goods imported from distant locations align with what scholars once thought achievable only in permanent, agrarian settlements. And these early earthen mounds aren’t the only monuments to the ingenuity of these cultures. Recent excavations of large shell mounds across the Southeast are also deepening archaeologists’ understanding of how socially complex Archaic peoples actually were.

ARCHAEOLOGISTS HAVE STUDIED ancient shell mounds in the Southeast for well over a century. In Florida in the late nineteenth century, the antiquarian Clarence Bloomfield Moore excavated many examples—the largest of which once stood more than 50 feet high. Until the 1970s, highway crews mined the mounds for road fill. Uncounted others have been washed away or submerged from view by rising sea levels. But there are still dozens of known Archaic shell mounds in the form of rings, half rings, ovals, and U-shapes along the Atlantic and Gulf Coasts of the Southeast and the Saint Johns River in Florida. At least 60 more have been identified in the Ohio River Valley.

Archaic people undoubtedly ate a great quantity of oysters,



clams, mussels, snails, and other mollusks. Analyzing the durable remains of a tiny portion of these millions of shellfish has become one of several new approaches archaeologists use to understand Archaic cultures. The shells themselves contain information on past climates and can be used to determine the seasons when groups on the coast were eating shellfish. “Research in the past twenty years has produced a sea change in the interpretation of Archaic shell sites,” says Louisiana State University archaeologist Rebecca Saunders, who led excavations at the Fig Island Ring Complex in South

Carolina, which has the largest shell ring on the Atlantic Coast. “Shell mounds and rings were not simply mounded garbage, but planned constructions that were locations of periodic population aggregation, interaction, ceremony, and feasting.”

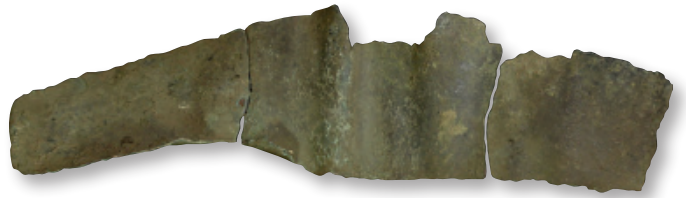
Some of the most recent data from shell mounds that suggests archaeologists have overlooked the complexity of Archaic culture comes from Sanger’s work on the Georgia coast, where he has uncovered evidence that Archaic networks involved not only goods, but also ideas. On Saint Catherines Island, Sanger and a team from the American Museum of Natural History excavated the center of a 4,000-year-old ring made of oyster shells known as the McQueen Shell Ring that was once thought to contain only kitchen waste. There, they found the cremated remains of at least eight people in a burial pit. The charred bone fragments are evidence of a burial practice that was very rare in the Southeast, but common among Archaic period people who lived around the Great Lakes. Affirming that connection, the pit also contained a worked copper band whose unique chemical signature matches copper deposits in northern Michigan, more than 1,000 miles away. The band could merely reflect a down-the-line exchange in which valued objects passed from neighboring community to neighboring community, but Sanger says the similarity in burial practices suggests there may have



These Archaic ceramic sherds represent the earliest pottery traditions developed in North America. Scholars call the styles Orange (left), which was made in Florida, and Stallings (right), which was made in Georgia and South Carolina.

been direct communication between these widely separated communities. “Periodic gatherings drew people from across the region, including very distant travelers,” says Sanger.

A second, larger shell ring on the island, known as the Saint Catherines Shell Ring, shows that Archaic communities, even those living near each other, were not all alike. Both rings are roughly 4,000 years old, and they lie just three miles apart. But the McQueen Shell Ring contained tools made from gray chert, volcanic material, and quartz that could have come from locations in the Piedmont, hundreds of miles away. Tools at the Saint Catherines Shell Ring were fashioned from materials from the nearby Savannah River watershed. People living at both sites made and used the same type of pottery, but the decorative and manufacturing techniques were distinct, suggesting that the people who constructed the McQueen Shell Ring came from outside the region and brought different materials and discrete social identities with them.



An Archaic copper band unearthed on Saint Catherines Island, Georgia, was fashioned from copper mined near the Great Lakes.

was equitably shared. “Late Archaic organization at ring sites may have been related, at least initially, to determining property and use rights of fisheries and other resources,” he says.

The locations of some Archaic sites may also demonstrate people’s ability to adapt to, and perhaps even to anticipate, the effects of climate change that coastal populations continue to grapple with today. In recent years, near the mouth of Florida’s Suwannee River, human remains have been washing out of coastal sand dunes that were as much as 10 miles inland when



A shell circle in marshland at South Carolina’s Fig Island site is part of one of the biggest shell complexes in the Archaic Southeast. Such large shell rings and mounds functioned as locations for ceremonies and feasting.

To gain a fuller understanding of why shell rings were built, Victor Thompson, director of the University of Georgia’s Laboratory of Archaeology, has studied oxygen isotope ratios and growth rings in some 38,000 oyster shells from 13 sites along the Georgia and South Carolina coasts. This data helps to reveal where and in what season the shells were harvested. His findings show that many of the sites were occupied through multiple seasons, and often even year-round. As sea levels fluctuated between 5,000 and 3,000 years ago, altering the estuaries where oysters thrive, communities flourished, moved away, and sometimes returned to reoccupy sites. Thompson suggests that the communities were close enough together that frequent interaction among people living in different villages would have been necessary to ensure that the oyster harvest

the burials occurred 5,000 years ago. Sassaman contends that these remains were originally buried in cemeteries near the ancient coastline and then disinterred and reburied in cemeteries farther inland. “As sea levels rose and overstepped the shoreline, settlements along the coast had to be abandoned and relocated landward,” he says. Sassaman believes coastal peoples may have seen what was coming in terms of sea level rise and planned for it by moving entire cemeteries to higher ground. “This suggests that the people may have anticipated relocation,” says Sassaman.

Not all Archaic shell monuments lie along the coast. They were also a prominent feature of the Archaic period along the rivers of the Ohio River Valley from about 5500 B.C. to around 800 B.C. Scholars contend that, much as they were in

the Southeast, the accumulations of shells in these areas were less a testament to the Archaic diet than deliberate constructions. “Shells could have accumulated anywhere along thousands of miles of riverbank, but they didn’t,” says Appalachian State University anthropologist Cheryl Claassen, who has studied 58 such sites. She suggests that shell mounds’ geographical distribution indicates that Archaic people were very selective about where they built them. Most occur in clusters midway up the Ohio River and all are found along rivers that drain into the Ohio. And a number of the shell accumulations are found on bluff tops, not along riverbanks where the shells might have been left if they were simply refuse.

Archaeologists excavating the shell heaps in the early and mid-twentieth century found thousands of burials, some with remains showing signs of violent death, but little evidence of permanent habitation, such as pottery or domestic tools. “These were mortuary places for geographically widespread groups who foraged in the region and perhaps elsewhere,” says Claassen. Ancient people probably considered shells a symbol of renewal, in part because they offer protection against the acidity of soils and help preserve buried bones. Like the mounds excavated in the Southeast, these sites in the Ohio River Valley would have been places where different peoples gathered to hold renewal rites during which they exchanged goods and held grand feasts.

PERHAPS NOWHERE IN North America were the renewal rites and feasts of the Archaic period held on such a grand scale as they were at northeast Louisiana’s Poverty Point. After the site was first explored in the 1830s, scholars insisted the extensive earthen mounds could only have been built by an advanced ancient Mesoamerican culture such as the



An aerial view of Poverty Point shows Mound A (top of photo) and the six concentric C-shaped ridges that are at the center of a site that extends for some 345 acres.

Olmec. As recently as the 1990s, archaeologists discounted the notion that any earthen mounds in North America had been built by Archaic people. Today, there is no doubt: At least a half dozen Archaic sites in the Lower Mississippi River Valley feature mounds, some of which, like those at Watson Brake, are oriented along what appear to be astronomical alignments. Many of these seem to have been built using a standard measurement of six feet, or roughly the span of a person’s outstretched arms. Radiocarbon dating of charcoal from Poverty Point has shown that its mounds were indeed built and inhabited by North American hunter-gatherers beginning around 3,500 years ago. And each new discovery about the site and the people who built it reinforces that they were not the simple hunter-gatherers portrayed in traditional academic narratives of the Archaic.

The earthworks themselves, a complex of mounds and six nested, C-shaped ridges, cover a terrace overlooking the Mississippi River floodplain. The largest mound at the site, known as Mound A, is the second-largest earthwork ever constructed

Distinctive decorated balls, known as Poverty Point Objects, were manufactured from fired fine-grained silts in great numbers at Poverty Point. They are found at sites throughout the southeastern United States.



in North America—only Monks Mound at Cahokia, built in Illinois almost 1,500 years later, rivals Poverty Point's Mound A. The site's scale is so vast that it went unrecognized as a single cultural landscape until aerial photographs of it were taken in the 1950s. From above, broad concentric ridges can be seen radiating outward from a central plaza like ripples in the earth. The outermost ridge is three-quarters of a mile in diameter and if all the ridges were laid end to end, they would stretch for 12 miles. Inside the inner ring is a central plaza that covers 37 acres, and that recent remote sensing surveys show once contained many large circles of wooden posts. Six earthen mounds of varying heights rise around the edges of the site, forming a landscape that took generations to engineer. And beyond the complex are suburban sites that stretch for more than three miles from it.

Despite a century of ongoing archaeological investigation, less than 2 percent of the site has been excavated. Even so, archaeologists have unearthed a striking array of tools, bowls, pendants, figurines, and decorated atlatl, or spear-thrower, weights. These objects were made of magnetite from Arkansas, silica stone from Oklahoma, galena from Iowa and Illinois, chert from Kentucky, quartzite from Alabama, soapstone from Georgia, gray flint from Indiana, and copper from as far away as the Canadian Maritime provinces, a distance of some 2,000 miles.

Whether or not this abundance of exotic materials represents the existence of a vast trade network is unclear. Poverty Point doesn't appear to have had much in the way of exports. "It was like a black hole," says University of Wisconsin–Milwaukee archaeologist Christopher Hays. "Stuff went in, but as far as we can tell, not much went out." But, says Hays, there are some fascinating exceptions—tiny, distinctive hand-molded balls fashioned from fine-grained sediments, which could have been heated in a fire and then placed in earth ovens to help cook food. Other Archaic groups manufactured such objects, but not in such enormous quantities. "No other culture made them with the care, variety, and standardization of form as the people of Poverty Point," Hays says. In fact, the balls are so distinctive and so abundant that they have been dubbed Poverty Point Objects, or PPOs. PPOs have been found at Archaic sites throughout the Lower Mississippi River Valley and as far away as southern Indiana, the Gulf Coast of Louisiana, and the Atlantic Coast of Florida. Visitors from Poverty Point may have carried them from home or visitors to Poverty Point may have brought them home as mementos of a long and dangerous pilgrimage. Many such visitors likely came to Poverty Point, but archaeologists believe the settlement also had a sizable permanent population. Clear evidence of habitation, including fire pits and household artifacts, has been discovered on the low-lying concentric ridges.

More than anything else, it is the scale of the site that challenges traditional notions of the Archaic period. "Poverty Point represents something that never existed before and has never existed since—a massive site that is the product of a population who relied solely on hunting, fishing, and

Spearpoints unearthed at Poverty Point are made from types of stone that were imported from as far away as Indiana.

collecting for subsistence," says Washington University in St. Louis archaeologist Tristram Kidder. "Exceptional sites demand explanations that account for their uniqueness." New evidence unearthed by Kidder and his colleagues at Mound A have underlined how unusual the social order at Poverty Point may have been.

Standing at the western edge of the site, Mound A is 72 feet high and around 700 feet on a side. The mound is made of 8.5 million cubic feet of earth—a volume roughly equal to 31,000 dump truck loads. For all its prominence, it appears to contain no burials and there is little evidence that its summit was ever intensively used. Even more surprising, however, is that it wasn't built over a period of years. Cross sections of the mound exposed by Kidder and his team revealed distinct layers of soil that vary in color or texture, but show no signs of weathering. "The mound was built rapidly in a period of probably less than three months," says Kidder, a feat that would have required a highly organized, disciplined work force of at least 1,000 people, and even more to feed, house, and support them.

All scholars now agree that the people of Poverty Point were hunter-gatherers. Reconciling the physical reality of Poverty Point with a simple, egalitarian culture, however, poses a challenge to traditional thinking about the Archaic period. "The people who lived at Poverty Point were far more complex than previously thought," Kidder says. "They had a large population and a kind of leadership capable of organizing this remarkable labor effort. That isn't a characteristic we have associated with hunter-gatherers."

This seeming paradox of a socially complex hunter-gatherer culture gives archaeologists new ways to consider the end of the Archaic period in the Southeast. Not long after the great mound at Poverty Point was completed 3,200 years ago, the site was abandoned. Up and down the Mississippi River Valley and along the Gulf Coast, cultures that had thrived for centuries appear to have withered and faded. At about the same time, shell ring construction along the Atlantic and Gulf Coasts also stopped. "The people of the Archaic didn't really disappear," says Sassaman, "but for the next 500 years or so, they became inconspicuous in the archaeological record." Scholars have attributed this to a variety of factors including drought, disease, food shortages, conflict, and abrupt changes in sea level. Underlying any of those possible causes may be something Sassaman says is more difficult to discern from the tools, structures, and waste heaps the people of that age left for the people of this age to ponder. "It could have been some kind of social or ideological crisis," says Sassaman, "the abandonment of a shared belief system that people gave up on because it didn't work for them anymore." ■

Mike Toner is a journalist living in Georgia.



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The wreck of *Borneo Maru*, a Japanese cargo ship that ran aground after being bombed by U.S. planes in October 1942, sits partially submerged in Gertrude Cove on the southern shore of Alaska's Kiska Island.



LETTER FROM ALASKA

THE COLD WINDS OF WAR

A little-known World War II campaign in the Aleutian Islands left behind an undisturbed battlefield strewn with weapons and materiel

by DANIEL WEISS

The journey to Kiska Island, at the far western end of Alaska's Aleutian chain, begins with a 1,200-mile flight from Anchorage to Adak Island. "You show up there and you feel like you're in one of the most remote places on Earth, and then you get on a ship and sail another day past that to Kiska," says Andrew Pietruszka, an underwater archaeologist at the Scripps Institution of Oceanography (SIO) and lead archaeologist for Project Recover. "The moment you sail in,

there are partially submerged ships sticking out of the water and you can see a Japanese midget submarine on shore. It's like the land of the lost, like you've stepped back in time to this amazing natural setting with no modern structures that is so rich in historical artifacts."

Those artifacts date to a period of unusually high activity on Kiska, during World War II and its immediate aftermath. A narrow, hilly, treeless island measuring less than

30 miles long, Kiska is dominated by a 4,000-foot-tall, snow-covered volcano at its northeastern tip. This landmark, however, is rarely visible, as the island is almost always shrouded in clouds. Located where the warm air of the Pacific Ocean to the south meets the cold air of the Bering Sea to the north, the Aleutians are home to legendarily foul and unpredictable weather: persistent fog in summer, vicious squalls in winter, and relentless chill and winds that blow up to 140

LETTER FROM ALASKA



miles per hour year-round. The islands' native Aleuts, who lived on Kiska at least until the late eighteenth century, when they were removed from the island by the Russians, call the Aleutians the "Birthplace of the Winds." Kiska's ground is mostly boggy muskeg, a dense, squishy mat of decaying vegetation that makes it challenging to get around even on the rare clear, calm day. "Imagine you're walking on a waterbed," says Dirk H.R. Spennemann, an archaeologist and cultural heritage management specialist at Charles Sturt University. "You don't have a firm footing until you put all your weight down, and sometimes it will then give way a bit more."

It's little wonder that, aside from the occasional fur trapper or seal hunter, the island was barely occupied in the first 75 years after the United States purchased Alaska in 1867. Then, in early June 1942, Japan invaded Kiska, along with Attu, a larger island some 200 miles to the west. The attacks were part of a larger campaign that included bombing a U.S. base at Dutch Harbor in the eastern Aleutians and invading Midway Atoll, more than 1,800 miles to the south. In the six months since the attack on Pearl Harbor, Japan had pressed its advantage, taking much of Southeast Asia and the islands of the South Pacific while sinking a large number of

Allied ships and losing few of its own. In April, however, U.S. planes had carried out the Doolittle Raid, slipping into Japanese airspace to bomb Tokyo and other targets. Alarmed at their vulnerability, the Japanese were determined to establish a

defense perimeter from the Central Pacific to the North Pacific Ocean to detect and counter future attacks. In particular, the western Aleutian Islands, located just 750 miles from Japan's northernmost base, on Paramushiro in the Kurile Islands, were seen as a potential launching pad for a U.S. invasion.

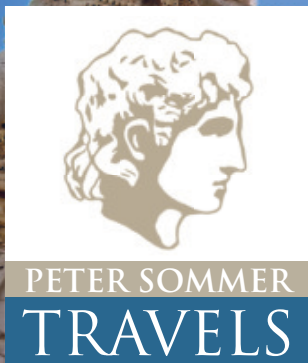
The Japanese had hoped to deliver a fatal blow to the Allied Pacific Fleet in the Battle of Midway, but instead were routed. They did, however, succeed in occupying Kiska and Attu. The only inhabitants of Kiska at the time were

the 10 crew members of a U.S. weather station, who put up little resistance. Despite an extensive U.S. bombing campaign and the notorious weather, the Japanese held both islands well into 1943 before they were retaken by the United States. After maintaining a presence on Kiska to prevent the Japanese from returning, the U.S. military left the island in 1946 and it has been uninhabited ever since. Today, it is part of the Alaska Maritime National Wildlife Refuge, overseen by the U.S. Fish and Wildlife Service (FWS), and visits are by permit only.

Kiska is a nearly unique example of a battlefield landscape that is almost entirely the product of wartime activity, and the island has drawn the attention of archaeologists such as Pietruszka and Spennemann. "Every military action which was not built over or destroyed by the American base development is still there: every single bomb crater, every single grenade crater," says Spennemann, who has surveyed Kiska's terrestrial battlefield remains for the FWS and the National Park Service. "The Japanese guns are still pointing skyward the same way they did when



A Japanese midget submarine, which measures nearly 80 feet long and had a two-man crew, was left behind on Kiska when the Japanese abandoned the island in July 1943.



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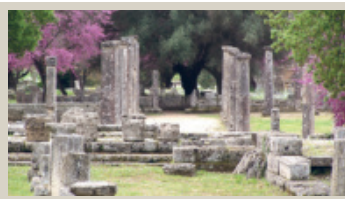
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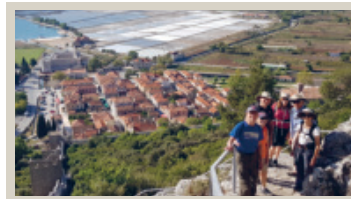
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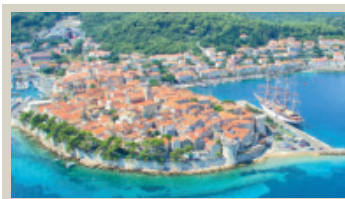
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LETTER FROM ALASKA



A Japanese anti-aircraft gun, one of many emplaced on Kiska to defend against U.S. air raids, still points at the island's perpetually cloudy skies.

the Americans were landing. Nothing has changed.”

Spennemann found one anti-aircraft gun that was in the process of being moved but had not yet been emplaced, still resting on its tires, which are still full of air. He found that the World War I-era Japanese coastal defense guns guarding Kiska Harbor are still outfitted with a rubber buffer to cushion the shoulders of those who turned their wheels to aim them. In the American camp area, Spennemann documented wooden boardwalks that had been built to more easily traverse the muskeg. And the Japanese midget submarine that sits on land near Kiska Harbor sports a large hole produced by a demolition charge set by the Japanese before they left the island, an example of their efforts to render their equipment unusable and to limit American understanding of their technology. By documenting these and other finds, as well as combing through military records, archaeologists have accumulated extensive evidence of how much effort and how many resources

When Japan took Kiska in June 1942, it had a foothold on North American soil for the first time—even if it was an island few Americans had ever heard of. American military commanders insisted that it be reclaimed. “Push the enemy into the sea,” read the order from the War Department in Washington. “Get Kiska back.” This turned out to be easier said than done. It would be more than a year before the Allies retook Kiska, and throughout that time they would struggle to muster the resources necessary to carry out the mission and to overcome the challenges posed by the hostile weather.

The primary tactic the United States employed against Kiska's occupiers



The Japanese oil transport ship *Nissan Maru* burns in Kiska Harbor, having been struck by U.S. bombers in June 1942, shortly after the Japanese invaded the island.

both sides put into the struggle for control of a seemingly inconsequential island far from the more famous arenas of World War II.

was aerial bombing. At first, each raid required flying 600 miles each way from an airstrip on Umnak. In September 1942, a new airfield on

Adak cut the one-way trip to 250 miles, and in February 1943, an airfield on Amchitka reduced it to just 75 miles. Flying conditions were harrowing—when they weren't outright impossible. Nearly constant turbulence battered planes around like toys. High winds and fog could send a pilot hundreds of miles off course, and a bomber that flew through a cloud front could emerge encased in ice. In the fall of 1942, the United States lost nine planes to combat in the Aleutians—and 63 to weather and mechanical trouble. Those planes that did return from their missions often had bent wings, loosened rivets, and badly shaken cockpit instruments. The ground crews that serviced them had to rely on wrecked planes for replacement parts.

Once bombers got to Kiska, pilots

often couldn't see their targets due to clouds and fog. They took to flying a preset course starting at the volcano, which usually poked above the clouds.

They would then count the seconds before dropping their payload, hoping to hit their target. Frequently, they failed. They often flew at high altitude



A cast-iron hydrant on Kiska was part of a firefighting network set up by the Japanese, an example of their planning for a long-term occupation of the island.

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LETTER FROM ALASKA

to avoid being shot down by the extensive array of Japanese anti-aircraft guns on the island, and the wind could easily interfere with their timing or blow their bombs off course.

In his surveys, Spennemann observed the evidence of these near misses on the ground. “You see the gun battery and the bomb craters, and you can see that the Americans tried to knock the guns out and that they didn’t,” he says. “They missed them. They were bombing blind.” In all, U.S. planes dropped 7 million pounds of bombs on the island, but succeeded in little more than harassing their enemy. U.S. bombers did have some success in attacking Japanese ships near Kiska, such as *Nissan Maru*, an oil transport ship that was sunk in June 1942, and *Borneo Maru*, a cargo vessel that was severely damaged and ran aground in October 1942. The latter wreck remains partially above water in Gertrude Cove on Kiska’s southern coast. Japanese anti-aircraft gunners were hampered by the poor visibility as well. They would either fire when they heard American planes overhead, or aim at gaps in the clouds and fire when planes appeared.

Historians have frequently portrayed Japan’s invasion of the Aleutians as a feint meant to divert American attention from its real target, Midway. However, Spennemann argues that the evidence from Kiska makes clear that the Japanese invested a great deal of resources there and saw occupying the island as an important strategic goal in itself. He points to the solidity of the wooden barracks they built, which they surrounded with high barriers of sod cut from the tundra to protect against the wind and cold. By contrast, when the Americans retook the island, they camped in tents with low sod barriers. The Japanese also constructed miles of tunnels on the island to provide refuge from U.S. bombs and even installed a network of cast-iron fire hydrants in their navy camp. “All of this indicates a lot of effort and that they intended to stay,” Spennemann says. “You don’t put that effort in for two or three months. This is something the historic data set doesn’t tell you, but which the evidence on the ground shows you.”

Moreover, when the Midway invasion failed, says Spennemann,



Split-toe *jika-tabi* footwear was left behind on Kiska by Japanese troops when they hurriedly evacuated the island at the end of July 1943.

a good deal of Japanese equipment already on its way there was rerouted to Kiska. This included a midget submarine base and a seaplane base, as well as a range of coastal defense and anti-aircraft guns. However, the midget submarines, which measure less than 80 feet long and held a two-man crew, turned out to be of little use in the rough Aleutian waters. Furthermore, as the Americans built bases closer and closer to Kiska, they came to dominate the island’s airspace, giving the Japanese seaplanes little opportunity to fly. The Japanese did try to build an airfield on the island, but their effort to level the spongy muskeg proved futile. Lacking heavy equipment, they were forced to make do with hand shovels and picks. Whenever they made any progress, U.S. planes would drop a few bombs on the runways and reduce them to a muddy morass.



Damaged wings hang in the Japanese seaplane hangar on Kiska, photographed after the United States retook the island in August 1943.

(continued on page 62)

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LETTER FROM ALASKA

(continued from page 60)

In early 1943, the United States resolved to invade Kiska with an amphibious landing force. But troops, supplies, and particularly ships were so hard to come by, given all the other active fronts in the war, that the plan was shifted to take Attu instead. Attu was thought to be occupied by only 500 Japanese troops versus thousands on Kiska. By the time of the invasion, on May 11, though, it had become clear there were actually around 2,600 Japanese troops on Attu. Anticipating the U.S. attack, they entrenched themselves in the island's rugged hills and, in a bloody battle that lasted until May 30, fought nearly to the last man.

In addition to its airfields on Adak and Amchitka, the United States now built one on Attu as well. On June 18, just as the Japanese had feared, the Americans used the new airfield to launch a bombing raid on Paramushiro, their first successful attack on Japan proper since the Doolittle Raid. The Japanese troops on Kiska were increasingly isolated. Already dominant in the air, the United States had set up a naval blockade several months earlier that made it extremely difficult for the Japanese to resupply their troops. The Japanese had had some success evading the blockade with their fleet of giant I-class submarines, each of which measured more than 350 feet long, dwarfing the largest U.S. submarines of the time. Having lost Attu, the Japanese decided in early June to use eight of these I-boats to evacuate their troops from Kiska.

Despite using the largest submarines available at the time, the Japanese would still have needed to make several dozen round trips to take all the troops off Kiska. Then, in the space of a few days, the U.S. Navy managed to sink two of these I-boats, killing the hundreds of evacuees on board. And, on June 22, *I-7* was



One of the generators that powered *I-7*, a giant Japanese submarine that ran aground after being damaged by a U.S. destroyer in June 1943, lies underwater off Kiska.

intentionally run aground after a two-day engagement with the destroyer USS *Monaghan*. Its demise marked the end of Japan's attempts to remove its troops using submarines.

During a 2018 survey of the waters off Kiska carried out by Pietruszka with colleagues from SIO, the University of Delaware, and Project Recover, an organization dedicated to retrieving the remains of missing U.S. service members, one of the team's objectives was to locate the wreck of *I-7*. They found it off the southeast corner of Kiska. U.S. military reports note that, after the Allies retook the island, Navy divers spent a month diving on the submarine to retrieve intelligence. As it turned out, the Japanese had likely beaten them to it. "We came across a reference saying that Japanese divers went out to *I-7*, tried to recover its codebooks, and then put scuttling charges on it and blew it up," says Pietruszka.

As the Allies geared up for their long-delayed invasion of Kiska in early August 1943, U.S. pilots sent on bombing and reconnaissance missions reported that the island was eerily quiet. Those in command debated whether the Japanese had managed to slip away or had merely retreated to the hills as they had on

Attu. They decided to proceed with the invasion in any case, reasoning that it would serve as good training even in the absence of the enemy. On August 15, a joint U.S.-Canadian force of nearly 35,000 troops stormed Kiska, but the Japanese were, indeed, gone. The invasion still took its toll as troops stumbling through the summer fog ended up in friendly firefights with each other, reportedly leading to at least 20 deaths and scores of injuries. Four more men were killed by booby traps set by the Japanese. And, on the night of August 18, USS *Abner Read*, a destroyer patrolling for submarines off Kiska, struck a Japanese mine, which blew off a 75-foot section of her stern and caused the deaths of at least 70 sailors. Only "extraordinary effort" prevented the entire vessel from sinking and plunging many more into the icy water, according to retired Rear Admiral Samuel J. Cox, director of the Naval History and Heritage Command.

Guided by a detailed after-action report, Pietruszka's team had a good sense of where *Abner Read*'s stern had sunk. However, the site is on Kiska's western side, where the wind is fiercest and the sea stormiest, so the team kept an eye out for a break in the weather to search for it. Once they had the opportunity, they found the stern with little trouble. "It was truly one



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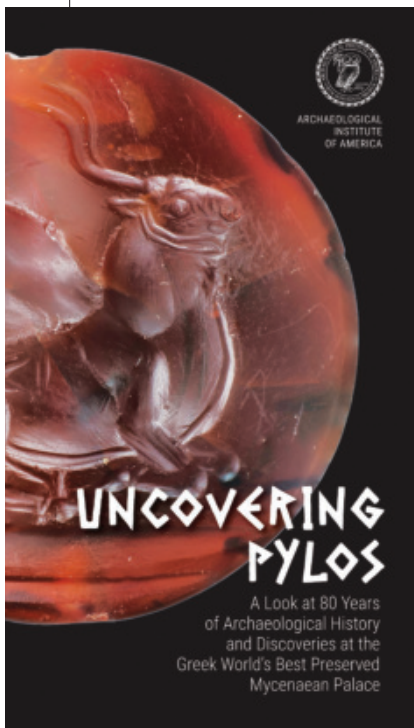
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LETTER FROM ALASKA



The abandoned cockpit of a Japanese seaplane lies near a lagoon on Kiska's eastern shore.

of those X-marks-the-spot things,” says Pietruszka. The stern contains the remains of at least some of the sailors who went down with it, says Cox, and the U.S. Navy plans to leave it in situ as a fit resting place for those who perished at sea. “It’s a war grave, a hallowed site,” he says, “and the United States Navy takes a dim view of anyone pilfering or scavenging war graves.”

Just how the Japanese managed to evacuate Kiska without being detected by the Americans can be attributed to equal parts luck, daring, and organizational efficiency. Having failed to remove their troops by submarine, and fearing that a U.S. invasion was imminent, the Japanese boldly opted to send in a surface fleet to do the job. On July 28, 1943, the 5,183 Japanese Army and Navy personnel remaining on the island were all ushered onto eight ships in around an hour. Space was extremely tight, and the troops left behind almost all their weapons and equipment, even dropping their small arms at the water’s edge to lighten their load. Some guns were later found in shallow water by American troops, and Spennemann believes that more must still lie at the bottom of Kiska Harbor. “The

Japanese pulling out that number of troops undetected is absolutely unbelievable,” he says, noting that there were no piers on the island at the time, and all these troops had to be ferried out to the ships on small launches. With that, the Japanese had made it off Kiska more than two weeks before the American invasion.

The summer fog had helped the Japanese fleet avoid being seen by American planes. In addition, two U.S. destroyers assigned to patrol Kiska Harbor had been called away several days earlier to pursue a number of Japanese ships 80 miles west of Kiska that had been picked up on radar by a U.S. reconnaissance plane. In the ensuing battle, several battleships and heavy cruisers fired hundreds of shells at what turned out to be nothing at all. The U.S. radar had apparently received soundings from flocks of migratory birds, and the engagement has come to be known as the Battle of the Pips—pip being a term for a radar contact. “It’s a battle the Navy would rather just as soon forget,” says Cox. “It wound up being the butt of many jokes.”

For the Japanese military leadership, the withdrawal from Kiska was seen as a tactical victory, says Spennemann. Given that the troops

were cut off from a viable supply chain and unable to launch any offensive operations, keeping them there no longer made sense. For the United States, the decision to retake Kiska was driven at least in part by the political unacceptability of allowing an occupation of North American territory to continue. Once U.S. forces had reestablished control of the island, they finished the airfield begun by the Japanese, but ultimately didn’t use it, or any of the other Aleutian Islands, as a launching pad for an invasion of Japan. “The weather was so bad that both the Japanese and the United



A wooden boardwalk built by U.S. troops helped them navigate Kiska's spongy muskeg terrain.

States quickly figured out that neither one was going to invade the other using the Aleutians as a springboard,” says Cox. In the struggle for Kiska, the weather was always the common enemy. And, in the end, it seems, the weather emerged as the victor. ■

Daniel Weiss is executive editor at *ARCHAEOLOGY*. For more images, go to archaeology.org/kiska



“Dispatches from the AIA” highlights the programs, resources, and services that the Archaeological Institute of America (AIA) provides each year for members, nonmembers, professional archaeologists, students, and anyone interested in archaeology.

ARCHAEOCON 2021

VIRTUAL ARCHAEOCON A HUGE SUCCESS

Saturday, April 24, was an exciting day as we hosted our first-ever virtual ArchaeoCon. The pandemic forced us to rethink and adapt many of our in-person activities for online audiences. After successful in-person events in 2019 and 2020, our third ArchaeoCon celebration was held completely online.

More than 800 people registered for ArchaeoCon 2021—almost twice as many as joined our in-person events! The daylong celebration of archaeology included live presentations, hands-on workshops, and exclusive on-demand content. Egyptologist Kara Cooney kicked off the live events with a fascinating presentation about women and power in ancient Egypt that highlighted six female pharaohs. Next, the team from Dig it Kids held a workshop during which they discussed the meaning of the symbols featured in family crests and led the audience in making and decorating cardboard shields.

After the workshop, ArchaeoCon participants were invited to drop in and chat with representatives of archaeological organizations from around the world in the “Discover Local Archaeology” session. In the second workshop, Shelby Brown, senior education specialist at the Getty Villa, introduced participants to Greek vase painting, discussed styles and techniques of pottery decoration, and helped participants create their own versions on clay tiles and cookies,



examples of which can be seen here. ArchaeoCon wrapped up with a presentation by explorer and TV personality Josh Gates, who shared stories of his expeditions.

In addition to the live events, participants were able to access on-demand content, including virtual galleries featuring submissions to the AIA's Build Your Own Monument and photo contests, archaeology trivia games, and recorded interviews with archaeologists Patrick Hunt and Alexandra Jones. Hunt highlighted his adventures in pursuit of archaeological knowledge in the Alps, while Jones shared insights about her journey to becoming an archaeologist and what it means to do community archaeology.

With ticket prices starting at just \$5, our goal was to make ArchaeoCon as accessible as possible. A great advantage of the virtual format was that participants were able to log in from all over the world.

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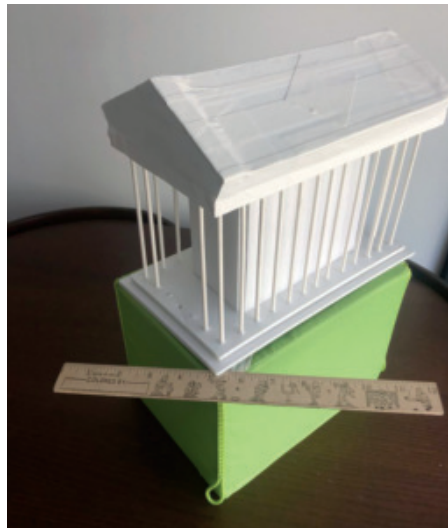
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Archaeology Abridged: These 30-minute talks feature archaeologists discussing a variety of topics. The talks are free, but registration is required.



In May and June, Martin Carver, a former British Army officer who became an archaeologist, discussed the site of Sutton Hoo in eastern England, which is famous for its Anglo-Saxon ship burial. The site, rediscovered in 1938 by Basil Brown and Edith Pretty, was featured in the 2020 movie *The Dig*.

Earlier talks have featured Kathleen Lynch discussing ancient Greek ceramics and what archaeologists can learn from ancient pottery; Beth Greene, who introduced listeners to the 2,000-year-old remains of a Roman fort and settlement at Vindolanda along

Hadrian's Wall in Britain; and Patrick Hunt, who presented his talks "The Fall of Civilizations: Famine & Climate Change," "Ötzi the Iceman's Prehistoric Medical Kit," and "Four New World Foods that Dramatically Changed European Lifestyles."

Find out more at archaeological.org/archaeology-abridged-webinars.

Build Your Own Monument: Last year's inaugural contest was a bright spot in the early part of the pandemic, and we were pleased with people's enthusiasm for the program. This year, the contest focused on the Parthenon, Angkor Wat, and Pueblo Bonito, and added a Pick Your Own Monument category. Read more at archaeological.org/build-your-own.



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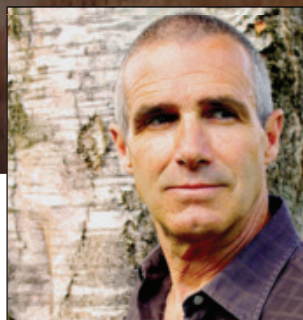


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When it was built nearly 5,000 years ago, the Great Pyramid of Giza was the tallest structure in the world, a title it would retain for more than 3,500 years, until it was surpassed by several of England's medieval cathedrals. The colossal pyramid was originally 481 feet tall and 755 feet square at the base, built of about 2.3 million blocks of quarried stone. Many of the craftspeople who worked on the pyramid lived in a village in Giza, just steps from the enormous edifice. Metalworkers, spinners, woodworkers, fishers, and stonemasons all require tools, 15 of which were found in this workers' village in the 1970s. These tools have now been closely examined by a team led by Martin Odler of the Czech Institute of Egyptology and Jiří Kmošek of the Academy of Fine Arts Vienna. "The tools offer a window through which we can glimpse the material culture of the people participating in pyramid building and connected projects at Giza during the Fourth Dynasty," says Odler.

Many copper tools from Old Kingdom Egyptian burials have previously been analyzed, but those the team examined are the first, much rarer, Old Kingdom metal tools found in a settlement to have been carefully studied. "We want to learn about the technology used to produce the tools and their resulting practical properties," says Kmošek. "Egyptians worked with materials available to them, especially from the Eastern Desert and Sinai. Thus, craftspeople must have developed approaches tailored to these materials." One such material is arsenical copper—copper with a high arsenic content—which is much harder than pure copper, and which can be made even harder by hammering and annealing. "One of the biggest unanswered questions we have is whether the copper ore already had high levels of arsenic, or whether the Egyptians deliberately added arsenic," says Odler. "If they did so, it probably implies more sophisticated expertise in the Old Kingdom than we thought was the case."

WHAT IS IT
Selection of tools
CULTURE
Egyptian
DATE
Old Kingdom, 4th Dynasty (ca. 2575–2465 B.C.)
MATERIAL
Copper
FOUND

DIMENSIONS
1 inch to 2.8 inches long



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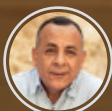
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